

FSEIS ADDENDUM
WDFW LAKE REHABILITATION
PROJECT PROPOSALS
2006



**WASHINGTON DEPARTMENT
OF FISH AND WILDLIFE
FINAL DETERMINATION OF
NON-SIGNIFICANCE
September 1, 2006**

State of Washington
DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: 600 Capitol Way N - Olympia, Washington 98501-1091 - (360) 902-2200, TDD (360) 902-2207
Main Office location: Natural Resources Building - 1111 Washington Street SE - Olympia, WA

ADDENDUM TO FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENTS

Dated: August, 1992 and January, 2002

Name of FSEIS:

1. Lake and Stream Rehabilitation Final Supplemental Impact Statement (FEIS), 1992-1993 and
2. Lake and Stream Rehabilitation: Rotenone Use and Health Risks FSEIS, 2002

The document (FSEIS and FEIS) is available to be read at:

Washington Department of Fish and Wildlife-Natural Resources Building,
1111 Washington Street SE, Olympia, WA.
Monday-Friday 8:00am – 5:00pm

Description of Proposal: Rehabilitation of lakes and streams in eastern Washington (Stevens, Okanogan and Grant Counties), by the use of Rotenone, to improve fishing for game fish via the elimination of other non-game or competitor species of fish, and to improve wildlife habitat by removal of exotic herbivorous fish. The FSEIS applied to statewide coverage.

Proponent: Washington Department of Fish and Wildlife, 600 Capitol Way North, Olympia, Washington 98501-1091. Contact Person Jon Anderson Ph: 360-902-2711.

Lead Agency: Washington Department of Fish and Wildlife

The lead agency is providing updated information on this project which may be of interest to other agencies or the public. The updated information provided below does not substantially change the analysis of significant impacts in the existing environmental checklist.

The original Final Supplemental Environmental Impact Statement, dated August, 1992, was reviewed as a statewide proposal. Implementation of the FSEIS includes the following lakes for the 2006-2007 season.

Location of Current Proposals:

Okanogan County

Pearrygin Lake - Section 36, Township 35 North, Range 21 East; Section 31 Township 35 North, Range 22 East; Section 01, Township 34 North, Range 21 East; Section 06, Township 34 North, Range 22 East Willamette Meridian (WM)

Long Lake – Section 13, Township 36 North, Range 29 East WM

Grant County

Warden Lake – Section 10, 15, 16, Township 17 North, Range 29 East WM

South Warden Lake - Section 15, Township 17 North, Range 29 East WM

Annex (Index) Lakes – Section 10, 11, 15, Township 17 North, Range 29 East, WM

Park Lake, Mirror Pond, and Rainbow (Vic Meyers) Lake – Section 10, 11, 12, 14, 15, 16, Township 24 North, Range 27 East WM

Blue Lake – Section 15, 16, 20, 21, 22, 29, Township 24 North, Range 27 East WM

Alkali Lake – Section 36, Township 24 North, Range 26 East; Section 01, Township 23 North, Range 26 East; Section 31, Township 24 North, Range 27 East; Section 06, Township 23 North, Range 27 East WM

North Potholes (Westlake ponds) – Section 33 and 36, Township 19 North, Range 27 East; and Section 31, Township 19 North, Range 28 East WM

Stevens County

McDowell Lake – Section 06, 07, 08, Township 34 North, Range 41 East WM

Based on the original Final Supplemental Environmental Impact Statement (dated, 8/92), the additional Supplemental Environmental Impact Statement (dated, 1/02 and the updated information provided in this addendum, the lead agency has determined that a new threshold determination is not warranted.

The lead agency will not act on this proposal for 30 days from the date of issue below.

Comments must be submitted by: August 31, 2006.

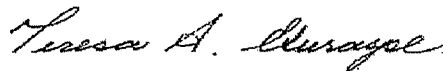
Responsible Official: Teresa A. Eturaspe

Position/Title: SEPA/NEPA Coordinator, Regulatory Services Section

Address: 600 Capitol Way North, Olympia, WA 98501

Please contact: Teresa A. Eturaspe **Phone:** (360) 902-2575 **Fax:** (360) 902-2946 or
e-mail: habitatSEPA@dfw.wa.gov if you have questions or comments about this determination.

DATE OF ISSUE: August 1, 2006 **SIGNATURE:**



SEPA Log Number: 06-051add (Addendum to Lake and Stream Rehabilitation, FSEIS, 1992 and Lake and Stream Rehabilitation: Rotenone Use and Health Risks, FSEIS, 2002)

LAKE MANAGEMENT PLANS

Water: Pearrygin Lake

Management Type: Trout Only

Location: Near the town of Winthrop, WA, Sec 36, T35N R21E; Sec 31 T35N R22E; Sec 1, T34N R21E; Sec 6, T34N R22E, Okanogan Co.

Size: 212 acres, 48 feet maximum depth, 6,260 acre-feet

Water Source: subsurface flow, plus water delivered via Chewuch Ditch District

Outflow: Chewuch Irrigation District outfall channel

Management History: Since its inception, this fishery has been managed as significant production trout water with excellent public access and camping facilities. Yearling trout have always averaged 11"-12" owing to the abundant food base. The lake opens on the last Saturday in April and closes Sept 30th.

Due to the illegal planting of spiny ray fishes (largemouth bass), fingerling rainbow plants have produced an inferior yearling both in size and robustness. As can be seen in the following table, the size and catch of the rainbows has declined dramatically over the past years. Good production waters should produce 11"-12" yearlings with a catch rate of 4-5 fish/angler.

Year	Average Length/Yearling	Fish/Angler
2000	11"	4.97
2001	11"	4.6
2004	9"	4.0
2005	10"	2.5
2006	10"	1.1

Current Management Objectives:

Continue to manage this lake for a trout only fishery. Provide at least four yearling rainbows and one carryover rainbow trout per angler trip for up to 10,000 angler trips per season.

(1) Fishery Objectives:

<u>Species</u>	<u>Type</u>	<u>Category</u>	<u>Number of Fish</u>		<u>Avg. Size</u>	<u>Exploitation</u>
			<u>/hour</u>	<u>/Angler</u>		<u>Rate</u>
Rainbow	Prod	Standard	2-3	4+	12 inches	80% 1-yr-olds
		Fishery		1+	16+ inches	20% 2+-yr-olds

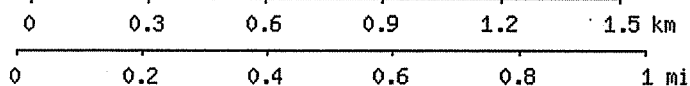
(2) Angler use objective (# angler days): Season – 10,000 +

(3) Stocking Objectives:

<u>Lake</u>	<u>Species</u>	<u>Number of Trout Stocked</u>			<u>Planting Month</u>
		<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	
Pearrygin	Rainbow	65,000	307	100	April/May

(4) Management Strategy:

- Check yearling growth; should be about 11-12 inches, adjust stocking rate as necessary.
- Expect 80% loss of yearling fish by end of season due to harvest and hooking mortality.
- Maintain about 15-20 percent of the catch at age 2+ years old, 15+ inch fish.
- Monitor angling activity and catch rates annually at opening day surveys.
- Monitor all fish species periodically by electrofishing or netting.
- Control spiny-ray species with rotenone when trout survival is inadequate to produce an acceptable fishery.
- Consider the use of sterile, triploid rainbow trout



* M
G

<http://www.topozone.com/print.asp?z=10&n=5374815&e=709813&size=1&u=6&datum...> 07/18/2006

PRE-REHABILITATION PLAN

Pearrygin Lake

I. PROPOSAL

A. Justification for Proposed Rehabilitation

(1-2) Pearrygin Lake has historically been one of the more productive trout lakes in Okanogan County. Illegal introductions of spiny ray fishes in recent years, has seriously compromised this once great fishing lake. Fingerling plants of rainbow can only produce yearling fish 8"-9" long due to competition with the warmwater species in the lake (largemouth bass, bridgelip suckers). Legal plants of rainbow trout could prolong the fishery, but are much more expensive to produce at the hatcheries and could be used at other less productive waters instead. In addition, angler surveys indicate a preference for fingerling planted fish that have experienced an entire growing season in the lake versus catchable trout that are planted just prior to the opener. Treatment is needed at this time to restore Pearrygin Lake back to trout only water.

(3) Primary management of these waters is for trout only.

(4) Lake rehabilitation with rotenone was successful in 1951 to remove suckers and largemouth bass.

B. Physical Description of Water Proposed for Rehabilitation

1. WATER: Pearrygin Lake
2. LOCATION: Sec 36, T35N R21E; Sec 31 T35N R22E; Sec 1, T34N R21E; Sec 6, T34N R22E, Okanogan Co.
3. SURFACE ACRES: 212
4. MAX. DEPTH: 48
5. VOLUME: 6260 acre-feet 17,022,993,000 lbs water
6. OUTLET: Chewuch Irrigation District outfall canal
7. STREAM: MILES N/A FLOW (cfs)
8. PUBLIC ACCESS: One-day use site (WDFW) with launch facility, Washington State Park with launching facilities
9. LAND OWNERSHIP: Public 80% Private 20%;
10. ESTABLISHED RESORTS: One with launch facility (Silverline Resort)

C. Proposed Management Actions

1. WATER: Pearrygin Lake
2. TARGET SPECIES: largemouth bass and bridgelip suckers
3. DATE LAST REHABED: Oct 10, 1951
4. PROPOSED TREATMENT DATE: Oct 2006
5. REPLANTING DATE: Late-spring 2007
6. SPECIES: Rainbow trout
7. STOCKING: 32,000 catchables (8"-10") and 65,000 fingerlings (3"-4")
8. PROPOSED TOXICANT: Rotenone, powder and liquid CONCENTRATION: 1 ppm
AMOUNT (ROTENONE AT 5% ACT. INGRED): 17,023 lbs powder, 30 gal liquid
9. METHOD OF APPLICATION: pumper boats - slurry and spray; ATV with sprayer; small boat with small sprayer, backpack sprayers
10. CREW DESCRIPTION: Leader Robert Jateff, Personnel 10-12

II. PURPOSE:

Pearrygin Lake has been managed as lowland lake trout waters since the 1950's. Complete rehabilitation is the only feasible method of restoring these waters to the trout type of management scheme. Complete removal of all competing species is the goal of the rehabilitation.

III. INTENDED OUTCOME/MEASURE OF SUCCESS:

We intend to restore Pearrygin Lake to its popular harvestable trout fishery, and improve its popularity by maintaining quality trout throughout the duration of the season. Success of this measure will be apparent during annual creel surveys. Given a reasonable chance of eliminating the populations of undesirable species, the beneficial effects should be noticeable one-two years post treatment.

IV. RESOURCE IMPACTS:

1. Target species: largemouth bass and bridgelip suckers
2. District and Regional Habitat, Wildlife and Non-Game biologists have been apprised of our rehabilitation plans. No objections were raised, and only cautionary concerns were expressed on the potential impacts to non-targeted species.

According to Bradbury (1986), the effects of rotenone on benthos are variable, depending on the concentrations and species. Crustaceans are most tolerant while the smaller insects are most affected. Immediate reduction of the population average 25%, and survival doubles when access to bottom sediments exists. Benthic communities generally recover to at least pretreatment levels within two months. Zooplankton is more severely impacted, and communities generally take two to twelve months to fully recover. While relatively tolerant of even heavy doses of rotenone, amphibians (especially larval) are at risk, and herptiles are affected somewhat less so.

3. Participation in the trout fisheries should exceed that currently found for existing fisheries. The water in the lake is used for both irrigation and recreation. Dead fish along the shoreline may be offensive to the property owners for a short time after treatment.
4. Observations by local WDFW biologists, indicate the lake is frequently used by osprey and bald eagles. Restocking of the lake post-rehab with sufficient fingerling rainbow should provide an uninterrupted food source for these fish eating birds.

V. MITIGATING FOR ADVERSE IMPACTS:

1. Trout survival and growth will be greatly enhanced. No removal of dead fish is planned as the nutrient base contained therein is best returned to the lake. Disturbance of waterfowl during treatment or by the anticipated fishery will be offset by increased food availability as the uncontrollable numbers of spiny-rayed fishes are eliminated in favor of easily balanced populations of trout.
2. Water will be confined to the lake proper, and treatment will be conducted when the irrigation season is over and water is no longer needed.
3. Protective gear for the eyes, face, hands and clothes will be supplied on-site for all purveyors

of rotenone.

4. The lake will be posted according to Department of Ecology guidelines to notify the public of the treatment and discourage the public from possessing or consuming dead fish. The landowners will be notified of the rehabilitation and consequent exposure of livestock to rotenone.

VI. RECREATIONAL IMPACT: also see I.A., II and III

Recreational angling opportunity will be increased if the undesirable species are removed from Pearrygin Lake. The level of participation will dwindle to almost nothing if no action is taken immediately. Given the success of the planned management action, as many as 10,000 fishing days are estimated for the season. Anglers should average about four-five fish per trip if the treatment is successful. Yearling trout should average about 11 inches. Carryovers should be expected to be about 20 percent of the catch, and average 15 inches for 2-year-old fish.

VII. ECONOMIC IMPACTS:

Rehabilitation would restore the fishery and associated economic activity. An estimated 10,000 or more trips will be made to Pearrygin Lake as a result of the proposed management action, with an economic impact totaling \$1,320,000 per year (2004 dollars; based on WDW estimate of \$132 per trip). Fingerling plants will cost the agency \$4,550, but is far less than the \$52,500 it now costs to produce the larger fish needed to counteract the presence of competing spiny ray species.

The cost of treatment will be approximately \$35,000, but the increase in license sales and subsequent boost to the local economy will more than offset that loss within two years after treatment.

VIII. RELATED MANAGEMENT ACTION:

Approximately 32,000 catchable (8"-10") and 65,000 fingerling (3"-4") rainbow trout will be stocked in early spring to provide immediate fishing opportunity. After the first year, subsequent fish plants will consist of fingerling trout only. Creel checks will be done annually on Pearrygin Lake, as well as population analysis to help in future management plans.

IX. PUBLIC CONTACT:

Public concern over the increasing numbers of lakes in Okanogan County with undesirable species infestations prompted this action.

A public meeting was held at the Methow Fish Hatchery in Winthrop on July 18th to discuss the rehab proposals. There were four people that attended the meeting (one from the Methow Fly Fishers, one from the Fly Fishing Federation, one from the Methow Valley News, and one from the Department of Ecology). Proposals and procedures for the lake rehabs were discussed and there were no objections noted to the plan.

Initiated by: Region Two Fisheries Management

LAKE MANAGEMENT PLANS

Water: Long Lake

Management Type: Trout Only

Location: Near the town of Tonasket, WA, Section 13, T36N and R29E in Okanogan County.

Size: 14.3 acres, 29 feet maximum depth, 203 acre-feet

Water Source: subsurface flow

Outflow: none

Management History: Since its inception, this fishery has been managed as a smaller lake trout production fishery, owing to its excellent productivity and easy boat access. Yearling trout have always averaged 11"-12" owing to the abundant food base. The lake opens on the last Saturday in April and closes Sept 30th.

Due to the illegal planting of spiny ray fishes (sunfish), fingerling rainbow plants have produced an inferior yearling both in size and robustness. As can be seen in the following table, the size of the rainbows has fluctuated dramatically over the past few years.

Year	Average Length/Yearling
2003	11"
2005	8"
2006	9"

Current Management Objectives:

Continue to manage this lake for a trout only fishery. Provide at least four yearling rainbows and one carryover rainbow trout per angler trip for up to 1,000 angler trips per season.

(1) Fishery Objectives:

<u>Species</u>	<u>Type</u>	<u>Category</u>	<u>Number of Fish</u>		<u>Avg. Size</u>	<u>Exploitation</u>
			<u>/hour</u>	<u>/Angler</u>		<u>Rate</u>
Rainbow	Prod	Standard	2-3	4+	12 inches	80% 1-yr-olds
		Fishery		1+	16+ inches	20% 2+-yr-olds

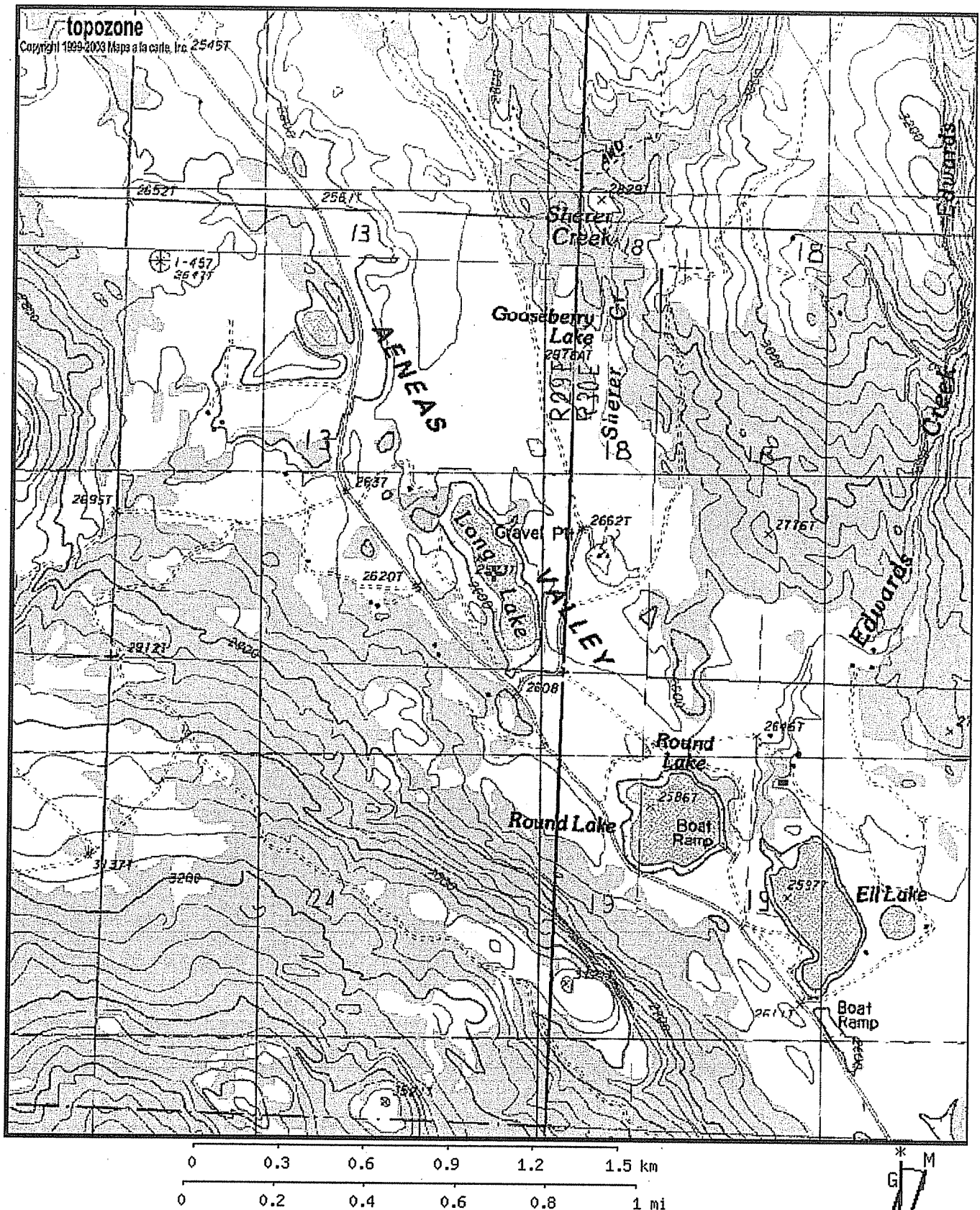
(2) Angler use objective (# angler days): Season – 1,000 +

vb (3) Stocking Objectives:

<u>Lake</u>	<u>Species</u>	<u>Number of Trout Stocked</u>			<u>Planting Month</u>
		<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	
Long	Rainbow	4,000	280	100	April/May

(4) Management Strategy:

- Check yearling growth; should be about 11-12 inches, adjust stocking rate as necessary.
- Expect 80% loss of yearling fish by end of season due to harvest and hooking mortality.
- Maintain about 15-20 percent of the catch at age 2+ years old, 15+ inch fish.
- Monitor angling activity and catch rates annually at opening day surveys.
- Monitor all fish species periodically by electro-fishing or netting.
- Control spiny-ray species with rotenone when trout survival is inadequate to produce an acceptable fishery.
- Consider the use of sterile, triploid rainbow trout



PRE-REHABILITATION PLAN

Long Lake

I. PROPOSAL

A. Justification for Proposed Rehabilitation

(1-2) Long Lake has historically been one of the more productive smaller size lakes in Okanogan County. Illegal introductions of spiny ray fishes in recent years, has seriously compromised this once great fishing lake. Fingerling plants of rainbow can only produce yearling fish 8"-9" long due to competition with the warmwater species in the lake (sunfish). Legal plants of rainbow trout could prolong the fishery, but are much more expensive to produce at the hatcheries and could be used at other less productive waters instead. In addition, angler surveys indicate a preference for fingerling fish that have experienced an entire growing season in the lake versus catchable trout that are planted just prior to the opener. Treatment is needed at this time to restore Long Lake back to trout only water.

(3) Primary management of these waters is for trout only.

(4) Lake rehabilitation with rotenone was successful in 1993 to remove yellow perch and largemouth bass.

B. Physical Description of Water Proposed for Rehabilitation

1. WATER: Long Lake
2. LOCATION: Sec 13, T36N R29E, Okanogan Co.
3. SURFACE ACRES: 14.3
4. MAX. DEPTH: 29
5. VOLUME: 203 acre-feet 552,023,584 lbs water
6. OUTLET: None
7. STREAM: MILES N/A FLOW (cfs)
8. PUBLIC ACCESS: One-day use site (WDFW) with launch facilities
9. LAND OWNERSHIP: Public 10% Private 90%;
10. ESTABLISHED RESORTS: None

C. Proposed Management Actions

1. WATER: Long Lake
2. TARGET SPECIES: sunfish
3. DATE LAST REHABED: Oct 7, 1993
4. PROPOSED TREATMENT DATE: Oct 2006
5. REPLANTING DATE: Late-spring 2007
6. SPECIES: Rainbow trout
7. STOCKING: 2,000 catchables (8"-10") and 4,000 fingerlings (3"-4")
8. PROPOSED TOXICANT: Rotenone, powder and liquid CONCENTRATION: 1 ppm
AMOUNT (ROTENONE AT 5% ACT. INGRED): 552 lbs powder, 10 gal liquid
9. METHOD OF APPLICATION: pumper boats - slurry and spray; ATV with sprayer; small boat with small sprayer, backpack sprayers
10. CREW DESCRIPTION: Leader Robert Jateff, Personnel 3-4

II. PURPOSE:

Long Lake has been managed as lowland lake trout waters since the 1950's. Complete rehabilitation is the only feasible method of restoring these waters to the trout type of

management scheme. Complete removal of all competing species is the goal of the rehabilitation.

III. INTENDED OUTCOME/MEASURE OF SUCCESS:

We intend to restore Long Lake to its popular harvestable trout fishery, and improve its popularity by maintaining quality trout throughout the duration of the season. Success of this measure will be apparent during annual creel surveys. Given a reasonable chance of eliminating the populations of undesirable species, the beneficial effects should be noticeable one-two years post treatment.

IV. RESOURCE IMPACTS:

1. Target species: sunfish
2. District and Regional Habitat, Wildlife and Non-Game biologists have been apprised of our rehabilitation plans. No objections were raised, and only cautionary concerns were expressed on the potential impacts to non-targeted species.

According to Bradbury (1986), the effects of rotenone on benthos are variable, depending on the concentrations and species. Crustaceans are most tolerant while the smaller insects are most affected. Immediate reduction of the population average 25%, and survival doubles when access to bottom sediments exists. Benthic communities generally recover to at least pretreatment levels within two months. Zooplankton is more severely impacted, and communities generally take two to twelve months to fully recover. While relatively tolerant of even heavy doses of rotenone, amphibians (especially larval) are at risk, and herptiles are affected somewhat less so.

3. Participation in the trout fisheries should exceed that currently found for existing fisheries. The water in the lake is used solely for recreation. Dead fish along the shoreline may be offensive to the property owners for a short time after treatment.
4. Professional biologists and other naturalists have visited this site frequently over the past 50 years and there are no sensitive species using the lake at this time.

V. MITIGATING FOR ADVERSE IMPACTS:

1. Trout survival and growth will be greatly enhanced. No removal of dead fish is planned as the nutrient base contained therein is best returned to the lake. Disturbance of waterfowl during treatment or by the anticipated fishery will be offset by increased food availability as the uncontrollable numbers of spiny-rayed fishes are eliminated in favor of easily balanced populations of trout. It is in the interest of all species being managed to refrain from over-taxing the food-base.
2. Water will be confined to the lake proper, since there is no outlet.
3. Protective gear for the eyes, face, hands and clothes will be supplied on-site for all purveyors of rotenone.
4. The lake will be posted according to Department of Ecology guidelines to notify the public of the treatment and discourage the public from possessing or consuming dead fish. The landowners will be notified of the rehabilitation and consequent exposure of livestock to rotenone.

VI. RECREATIONAL IMPACT: also see I.A., II and III

Recreational angling opportunity will be increased if the undesirable species are removed from Long Lake. The level of participation will dwindle to almost nothing if no action is taken immediately. Given the success of the planned management action, as many as 1,000 fishing days are estimated for the season. Anglers should average about four-five fish per trip if the treatment is successful. Yearling trout should average about 11 inches. Carryovers should be expected to be about 20 percent of the catch, and average 15 inches for 2-year-old fish.

VII. ECONOMIC IMPACTS:

Rehabilitation would restore the fishery and associated economic activity. An estimated 1,000 or more trips will be made to Long Lake as a result of the proposed management action, with an economic impact totaling \$132,000 per year (2004 dollars; based on WDW estimate of \$132 per trip). Fingerling plants will cost the agency \$280, but is far less than the \$5,600 it now costs to produce the larger fish needed to counteract the presence of competing spiny ray species.

The cost of treatment will be approximately \$2,500, but the increase in license sales and subsequent boost to the local economy will more than offset that loss within two years after treatment.

VIII. RELATED MANAGEMENT ACTION:

Approximately 2,000 catchable (8"-10") and 4,000 fingerling (3"-4") rainbow trout will be stocked in early spring to provide immediate fishing opportunity. After the first year, subsequent fish plants will consist of fingerling trout only. Creel checks will be done annually on Long Lake, as well as population analysis to help in future management plans.

IX. PUBLIC CONTACT:

Public concern over the increasing numbers of lakes in Okanogan County with undesirable species infestations prompted this action.

A public meeting was held at the Methow Fish Hatchery in Winthrop on July 18th to discuss the rehab proposals. There were four people that attended the meeting (one from the Methow Fly Fishers, one from the Fly Fishing Federation, one from the Methow Valley News, and one from the Department of Ecology). Proposals and procedures for the lake rehabs were discussed and there were no objections noted to the plan.

Initiated by: Region Two Fisheries Management

LAKE MANAGEMENT PLANS

Updated July 2006 – J. Korth

Water(s): Warden, South Warden, and Annex (Index) Lakes

Location: Seep Lakes Wildlife Area, Sec 10,11,15,16 T17N R29E; approximately 4 miles west of Warden and 5 miles southeast of the southeast corner of Potholes Reservoir, Grant County, WA

	Size:	Maximum Depth:
Warden	211 acres	70 feet
South W Warden	25 acres	30 feet
Annex Lake 1	2 acres	8 feet
Annex Lake 2	18 acres	30 feet
Shay Pond	4 acres	5 feet

Water Source: subsurface seepage springs

Outflow: 5 cfs to Lind Coulee

Management History: The Warden, South Warden, and Annex chain of lakes lie in the Seep Lakes Wildlife Area. Warden Lake is 211 acres and among the largest trout-only waters in Grant County, while the remaining waters in this system are rather small and have limited public access through agreements with the landowners. Warden Lake has been a popular trout fishery since first stocked with rainbow trout in 1954. Through the mid-1960s as many as 2,000 anglers attended the fishery on an opening day, and catch rates were as high as 7 to 9 fish per angler (Table 1). Boating access is available at Warden Lake, while anglers must walk into the remaining smaller lakes.

Seasons, regulations: Regulations have generally followed statewide rules for most of Warden Lake's history. The daily limit is currently five trout, and bait is allowed. The Annex lakes are open to angling year-round. The Warden lakes were originally on the statewide April Opening Day season. The small, state-owned access area was insufficient to handle the large crowds. Anglers roamed everywhere, including vehicles, and upland habitat suffered. In 1980 and in conjunction with many other Basin waters suffering the same habitat degradation, the opening day was changed to March 1st through July 31 in an attempt to spread out and control crowds. Weather in early March is unpredictable, and often these waters are covered with ice. Opening day crowds were indeed dissuaded; however, unfavorable weather conditions also often diminished angling success. Improved access areas and landowner agreements offered better crowd control than in the past. In 2001, the season was changed back to the statewide late-April opener (last Saturday in April through September 30) to encourage more anglers to ply their wares on Warden Lake, a complete turn around from the perceptions that instigated the March 1st opener over twenty years before. Opening day catch rates of fingerling-origin yearlings initially improved.

Table 1. Warden Lake opening day catch and effort summary: 1954 - 2005.

Year	Fish/ angler	Fish/ hour	Age 1+ average length	Age 2+ average length	Age 2+ % of catch	Total Effort (angler trips)	Total Harvest	Comments
54	First stocked with rainbow trout fry @ 100-200/lb; produced 11-12" fish.							Frank White
55-64:	no creel data. April Opener.							<u>#RB Stocked</u>
64								140K @100
65	9.0					2,013	18,237	140K @100
66	7.0					1,267	8,894	100K @8
66								Sept Rehab
67	9.0					860	7,740	82K@140
68	7.0					1,580	13,277	60K@170
69	1.0					728	750	
69								July Rehab
70-73:	no creel data							
72								80K@160
73								81K@135-160
74	7.7					186	1,426	80K@103-123
75	3.0					91	306	25K@138
76	1.5					20	35	0
77						0		20K@138
78-79:	no creel data							
80	Begin March 1 Opener with 75K@80-100 RB Stocked							April Rehab
81	1.0		12.0		0.0			
82								No data
83								No data
84	1.2		10.3	15.0	2.0			
85	2.0	0.9	10.0	13.0	?			Ice cover 80%
86	3.2		11.0		10.0			
87	1.9		10.6	15.0	9.0			Perch present
88	3.2		10.8	14.5	10.0			
89								No data
90	0.2	0.1	10.5		0.0			
91								April Rehab
92	3.6	1.7	10.6					
93	2.3	0.7	12.0	14.9	41.0			Iced 100%
94	2.0	0.6	12.3	20.9	1.0	517	1,020	
95	0.2	0.1	14.4	18.3	67.0	253	68	
96	0.6	0.2	13.4	17.7	18.0	210	152	Ice cover 95%
97	0.1	0.1	none	17.3	100.0	no estimate possible		Ice cover 50%
98	1.5	0.9	9.2		0.0	368	463	October rehab

99	0.3	0.1	9-10		none	Catchable RB added (30K); Windy
00	1.2	0.2	12.0	14-16	92 ?	Yrlg-carryover sig size overlap?
01	4.7		13.0	19	3	change to late-April Opener Catchable RB added (30K)
02	4.7		13.4	15+?	1-2	Yrlg-carryover sig size overlap Catchable RB added (14K)
03	2.1		14.7	18.5	1-2All	Yrlg-carryover sig size overlap RB all fingerling origin.
04	3.8		11.9	16.8	8	Yrlg-co sig size overlap 12-17"
05	3.6		10.0	15.5	5	RB all fingerling origin.
06	3.5		11.5	145-17"	8	Catchable RB added (25K)
06 proposed October Rehab						~ 20% 9" catchables

Rehabilitations: Contamination by spiny-ray species has been the largest obstacle to managing these waters as trout fisheries. Carp and other spiny rayed fishes eventually invaded the system from Lind Coulee, and the first rehabilitation was necessary in 1966. Only one part per million was used in 1966, and the carp were not eliminated from Warden Lake. Within two years, the carp population had rebounded dramatically, and a second rehabilitation in 1969 using toxaphene was probably successful in removing the carp from the system. After each of the first two rehabilitations of this lake, anglers enjoyed a period of very good trout fishing, averaging 4-9 fish on opening day. It was 5 years after the second rehabilitation before sufficient numbers of carp re-invaded from Lind Coulee, reproduced, and over-ran the lake once more.

An outlet barrier on the outflow of Warden Lake was constructed in 1979 with financial assistance from the U.S. Bureau of Reclamation. In addition, a semi-permeable barrier was constructed blocking the inflow to Warden Lake from the Index Lakes. The third rehabilitation in April, 1980 employed 4 ppm rotenone and successfully eradicated carp from the system. Yellow perch, however, persisted. This was probably due to that species' early spawning behavior (~40 F water temperature), long incubation period (~21 days), and the inability of rotenone to kill fish in the egg stage. If large numbers of perch spawned just previous to rehabilitation, the fry would not emerge from those eggs until three weeks later. The rotenone would likely have detoxified by that time, and a large year class of perch would be available to take advantage of the lake's unclaimed food base. About three years later, the perch would mature and create an overwhelming year class followed by poor trout fry survival. The fourth rehabilitation of Warden Lake in April of 1991 suffered the same fate in-so-far as its failure to eradicate the perch. Perch eggs were actually observed during that treatment.

The fifth treatment was conducted in the fall of 1998 in order to avoid the perch spawn, and no yellow perch have been observed since. While the perch population may have been eradicated, it is possible that some small number remain. Brown bullheads and pumpkinseed sunfish have persisted and comprised an overwhelming portion (> 90%) of fish numbers and biomass in Warden Lake by 2005 (June 2005 electrofishing survey). Fisheries for these species were non-

existent at Warden Lake.

Stocking allotments: Early stocking rates for Warden Lake exceeded 500 fish per acre and still produced an 11-12 inch rainbow by opening day. Stocking rates have been reduced from the early years to about 350 fish per acre (about 70,000 rainbow fingerlings @ 80-100/lb), usually Goldendale or Spokane rainbow broodstock. Brown trout became part of the annual allotment in 1992; however, this species did little to slow down the expanding population of perch. Catchable-sized (9-10") rainbow were added to the fishery previous to opening day in 2001 and 2002; however, these additional fish failed to make a significant contribution to the catch during either year, so were discontinued. Yearling size has regularly exceeded expectations to the extent that it was difficult to separate yearlings from carry-overs, especially in 2003. Excessive yearling size has been an indication of poor fingerling survival. In 2004, size began to diminish, and in anticipation of a failed fingerling-based fishery, catchables were added previous to the 2005 opener. Almost all the rainbow checked opening day 2005 and all rainbow observed in a subsequent survey were attributed to the addition of the catchables. In 2006, fingerling survival was apparently somewhat better, and catchables were only 20% of the opening day catch. However, the catchability of the larger fingerling-based yearlings is often better than catchables newly introduced to a lake.

Avian predation: Since the late 1980's, a relatively new management issue for this water has been the increasing number of piscivorous birds frequenting the area. Cormorants have become spring breeders and summertime residents. Pelicans are also frequent summertime residents on Warden Lake, and mergansers are primarily winter predators. While no uncontested proof of damage to the fishery exists, these species are primarily fish eaters. It is suspected that many of the unpredictable and unexplainable failures of the fisheries, which occur periodically in the Seep Lakes Area, including Warden Lake, could be attributable to these avian species.

During the last five or six years, large numbers of cormorants (100's) and pelicans (dozens) have been frequently observed feeding at the lake through spring and into mid-summer. Fish species consumed are unknown, and the impact to fingerling rainbow remains unquantified; however, even an average of 20 cormorants each consuming 2 lbs per day could remove 36,000 rainbow fingerlings (@ 30/lb avg.) per month. The stocking allotment for Warden Lake is only 70,000 rainbow trout.

T&E Flora and Fauna: Professionals from many resource fields have visited this site countless times during the last 40 years. No known report exists of any threatened or endangered species habitually found in or near these lakes. Double-crested cormorants, discussed above, are spring to fall visitors, although all known nesting occurs on Potholes Reservoir. Occasional visits from both bald and golden eagles occur, and no nests of these two species are known in the area. Protected species of waterfowl and other birds frequently are found here at times, as well.

Current Management Objectives: Warden and South Warden Lakes

Last Saturday in April through September 30, production type trout fishery. Five fish limit, no size or gear restrictions. Provide 4+ yearling 12 inch rainbow trout per angler trip for 1,000 anglers on opening day, and 3 trout per angler for the remaining part of the season for at least 3,000 additional angler trips. Warden Lake could sustain well over 10,000 angler trips per year.

1. Fishery Objectives:

<u>Species</u>	<u>Type</u>	<u>Category</u>	<u>Number of Fish</u>		<u>Avg. Size</u>	<u>Exploit.</u>
			<u>/hour</u>	<u>/Angler</u>		<u>Rate</u>
Rainbow	Prod	Opening Day	2-3	4	11 inches	90% 1-yr-olds
		Season Average	1-2	3	12-14 inches	90% 1-yr-olds

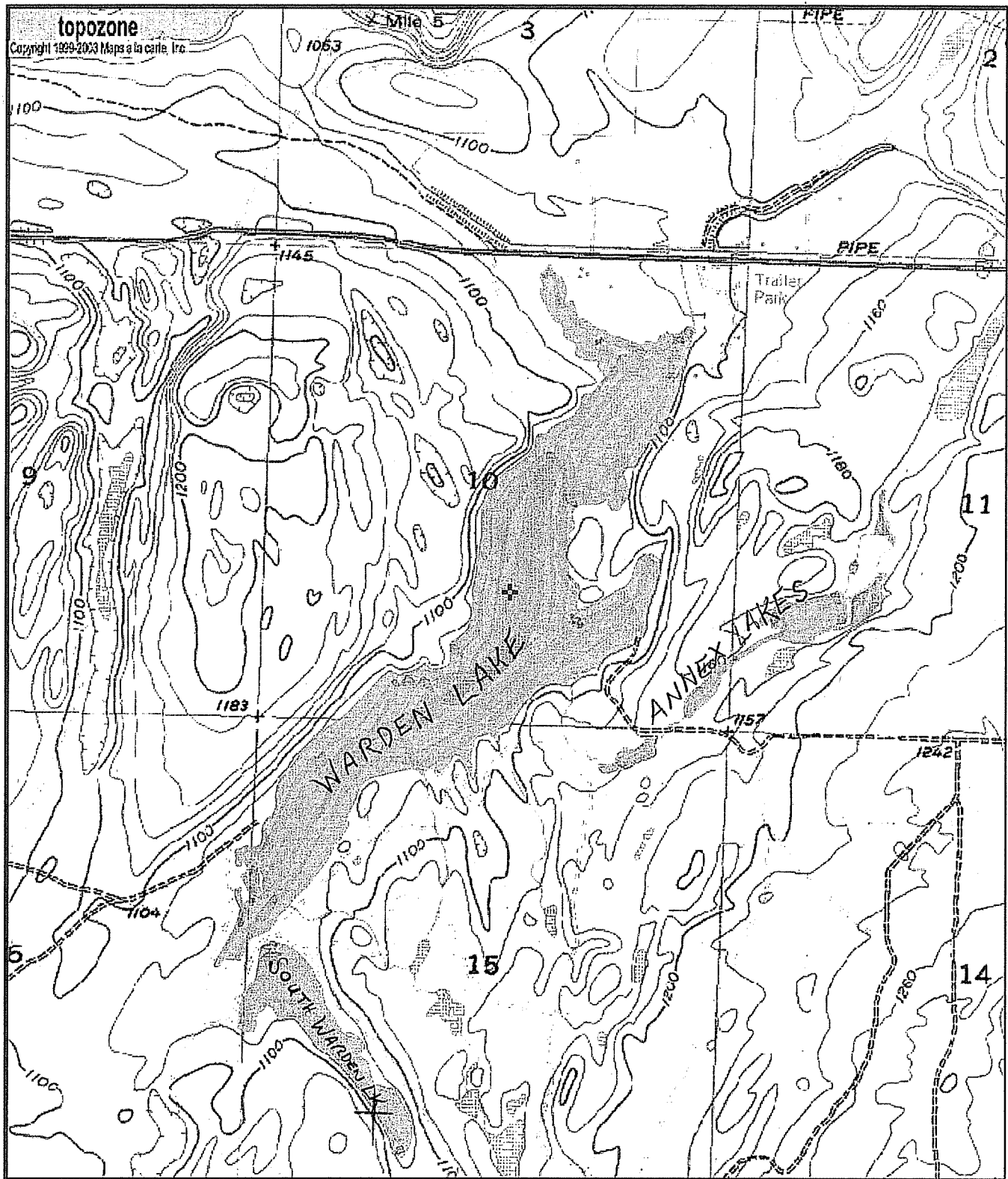
2. Angler use objective (# angler days): Season - 4,000 minimum; up to 12,000.

3. Stocking Objectives:

<u>Lake</u>	<u>Species</u>	<u>Number of Fish Stocked</u>			<u>Planting Month</u>
		<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	
Warden	Rainbow	70,000	310	<80	May
	Brown Trout	10,000	50	<80	May
South	Rainbow	8,000	320	<80	March
Warden	Brown Trout	1,300	50	<80	May

E. Management Strategy:

- Plant rainbow fry in spring.
- Check yearling growth; should be about 11 inches, adjust stocking rate as necessary.
- Harvest 90% of yearling fish by end of season.
- Monitor all fish species periodically by electrofishing or netting.
- Substitute fall fingerlings for at least a portion of the spring fry when competing species begin to impact trout fry survival.
- Control spiny-ray species with rotenone when trout survival is inadequate to produce an acceptable fishery.
- Manage the Annex Lakes as low key, walk-in fisheries on a year around season consistent with the landowners' desires. Stocking rates 100-200 rainbow and/or brown trout per acre.



0 0.3 0.6 0.9 1.2 1.5 km
0 0.2 0.4 0.6 0.8 1 mi

Map center is 46° 58' 27"N, 119° 09' 44"W (WGS84/NAD83)

Soda Lake quadrangle

Projection is UTM Zone 11 NAD83 Datum

M
G
M=17.263
G=-1.581

PRE-REHABILITATION PLAN

Warden, South Warden, and Annex Lakes

I. PROPOSAL

NOTE: The proposal to rehabilitate Warden Lake in 2006 is a back-up proposal to other Regional waters in the event those lakes are not rehabilitated in 2006.

A. Justification for Proposed Rehabilitation

The Warden, South Warden, and Annex chain of lakes lie in the Seep Lakes Wildlife Area southeast of O'Sullivan Dam and Potholes Reservoir. Warden Lake is 211 acres and among the largest trout-only waters in Grant County, while the remaining waters in this system are rather small and have limited public access. Warden Lake has been a popular trout fishery since the mid-1950's, and as many as 2,000 anglers have attended the fishery on an opening day.

Carp and other spiny rayed fishes eventually invaded the system from Lind Coulee. It was not until an outlet barrier on the outflow of Warden Lake was constructed in 1979, and the third rehabilitation, that carp were successfully eradicated from the system. Yellow perch, however, persisted. This was probably due to that species early spawning behavior (~40 F water temperature), long incubation period (~21 days), and the inability of rotenone to kill fish in the egg stage. Perch eggs were actually observed during the fourth rehabilitation of Warden Lake in April of 1991. The fifth treatment was conducted in the fall of 1998, and no yellow perch have been observed since. While the perch population may have been eradicated, it is possible that some small number remain. Brown bullheads and pumpkinseed sunfish have persisted and currently comprise an overwhelming portion (> 90%) of fish numbers and biomass in Warden Lake (June 2005 electrofishing survey). Fisheries for these species do not attract many anglers to Warden Lake and are negligible.

Other factors have also plagued management of Warden Lake, complicating the consistent production and evaluation of the fishery. The March 1st opener remained in effect after the last rehabilitation, and unfavorable weather conditions often diminished participation and angling success (Table 1). In 2001, the season was changed to the statewide late-April opener (last Saturday in April through September 30). Opening day catch rates of fingerling-origin yearlings improved. Catchable-sized (9-10") rainbow had also been added to the fishery previous to opening day in 2001 and 2002; however, these additional fish failed to make a significant contribution to the catch during either year, so were discontinued.

Yearling size has regularly exceeded expectations to the extent that it was difficult to separate yearlings from carry-overs, especially in 2003. Excessive yearling size has been an indication of poor fingerling survival. In 2004, size began to diminish, and in anticipation of a failed fingerling-based fishery, catchables were added previous to the 2005 opener. Almost all the rainbow checked opening day 2005 and all rainbow observed in a subsequent survey were attributed to the addition of the catchables. Catchables were also added to prop up the 2006 opening day fishery.

Avian predation has also increased on Warden Lake and is assumed to be a factor in fingerling survival. Large numbers of cormorants (100's) and pelicans (dozens) are frequently observed feeding at the lake through spring and into mid-summer. Fish species consumed are unknown, and the impact to fingerling rainbow remains unquantified; however, even an average of 20 cormorants each consuming 2 lbs per day could remove 36,000 rainbow fingerlings (@ 30/lb avg.) per month. The stocking allotment for Warden Lake is only 70,000 rainbow trout.

Table 1. Warden Lake opening day catch and effort summary: 1991 - 2006.

Year	Fish/ angler	Fish/ hour	Age 1+ average length	Age 2+ average length	Age 2+ % of catch	Comments
91	April Rehab					
92	3.6	1.7	10.6			
93	2.3	0.7	12.0	14.9	41.0	Iced 100%
94	2.0	0.6	12.3	20.9	1.0	
95	0.2	0.1	14.4	18.3	67.0	
96	0.6	0.2	13.4	17.7	18.0	Ice cover 95%
97	0.1	0.1	none?	17.3	100.0	Ice cover 50%
98	1.5	0.9	9.2		0.0	Catchable RB added (30K)
98	October Rehab					
99	0.3	0.1	9-10		none	Catchable RB added (30K); Windy
00	1.2	0.2	12.0	14-16	92 ?	Yrlg-carryover sig size overlap?
01	change to late-April Opener					
01	4.7		13.0	19	3	Catchable RB added (30K) Yrlg-carryover sig size overlap
02	4.7		13.4	15+?	1-2	Catchable RB added (14K) Yrlg-carryover sig size overlap
03	2.1		14.7	18.5	1-2	RB all fingerling origin. Yrlg-co sig size overlap 12-17"
04	3.8		11.9	16.8	8	RB all fingerling origin.
05	3.6		10.0	15.5	5	Catchable RB added (25K)
06	3.5		12.2	15-16	4-5	Catchable RB added (25K)
06-07	proposed October Rehab					

It has been eight years since the last treatment of these lakes. Fingerling trout survival has been erratic at best. WDFW policy states that lake rehabilitation is an option for eliminating undesired fish in an effort to restore the intended management scheme. Alternatives to rehabilitation are costly or impractical. To maintain a comparable fingerling-stocked trout fishery in Warden Lake with catchable-sized fish would take 50,000 catchable rainbow. This would constitute about half of the District's entire normal allotment of catchable trout. Region Two lacks the hatchery space and water to institute a catchable fish- stocking program as a substitute for lake rehabilitation. Stocking catchable sized fish also costs almost ten times the

cost of a fry plant. Optimistic estimates of survival of even 4-6 inch advanced fry in these waters range from 10-20 percent. Spring fingerling survival in lakes free of competing species ranges from 50-80 percent.

B. Physical Description of Water Proposed for Rehabilitation

1. WATER: Warden Lake

2. LOCATION: Sec 10,15 T17N R29E Grant Co.
3. SURFACE ACRES: 211 MAXIMUM DEPTH: 70 feet
4. VOLUME: 5,721 acre-feet; 15,550,502,000 lbs. H₂O
5. OUTLET: Permanent, small creek drains to Lind Coulee/Potholes Reservoir.
6. STREAM: ~1 mile FLOW: 5 cfs
7. PUBLIC ACCESS: Parking, toilets, shoreline access, and boat launch at northwest end; shoreline access at southwest end.
8. LAND OWNERSHIP: PUBLIC 20% PRIVATE 80 %
9. ESTABLISHED RESORTS: One resort on the north end of the lake, and a small semi-retirement community (Mallard Haven) on the northeast end of the lake.

1. WATER: South Warden Lake

2. LOCATION: Sec 15, T17N R29E Grant Co.
3. SURFACE ACRES: 25 MAXIMUM DEPTH: 30 feet
4. VOLUME: 348 acre feet; 945,914,000 lbs. H₂O
5. OUTLET: Permanent, small creek drains to Warden Lake.
6. STREAM: 50 ft. FLOW: 1-2 cfs
7. PUBLIC ACCESS: Shoreline access through agreement with private landowner.
8. LAND OWNERSHIP: PUBLIC 0% PRIVATE 100 %
9. ESTABLISHED RESORTS: None; public fishing access by agreement with the landowner.

1. WATER: Annex Lakes (formerly referred to as Index Lakes, and including Shay Pond)

2. LOCATION: Sec 11,15 T17N R29E Grant Co.
3. SURFACE ACRES: 26 MAXIMUM DEPTH: 30 feet
4. VOLUME: 213 acre feet; 577,744,000 lbs. H₂O
5. OUTLET: Permanent, small creek drains to Warden Lake.
6. STREAM: ~0.5 miles FLOW: 1-2 cfs
7. PUBLIC ACCESS: Shoreline access through agreement with private landowner.
8. LAND OWNERSHIP: PUBLIC 0% PRIVATE 100 %
9. ESTABLISHED RESORTS: None; public fishing access by agreement with the landowner.

C. Proposed Management Actions

1. WATER: Warden Lake

2. TARGET SPECIES: brown bullheads, pumpkinseed sunfish, possibly yellow perch
3. DATE LAST REHABED: October 1998
4. PROPOSED TREATMENT DATE: September-November, 2006
5. REPLANTING DATE: Spring 2007
6. SPECIES: rainbow trout, brown trout
7. CATCHABLES: 50,000 FINGERLINGS: 80,000
8. PROPOSED TOXICANT: Rotenone, powder and liquid CONCENTRATION: 3 ppm
AMOUNT (ROTENONE AT 5% ACT. INGRED): 46,261 lbs., 45 gal.
9. METHOD OF APPLICATION: pumper boat slurry and airboat/ATV spray
10. CREW DESCRIPTION: Leader(s) Jeff Korth Personnel ~12

1. WATER: South Warden Lake

2. TARGET SPECIES: brown bullheads, pumpkinseed sunfish, possibly yellow perch
3. DATE LAST REHABED: October 1998
4. PROPOSED TREATMENT DATE: September-November, 2006
5. REPLANTING DATE: Spring 2007
6. SPECIES: rainbow trout, brown trout
7. CATCHABLES: 5,000 FINGERLINGS: 12,000
8. PROPOSED TOXICANT: Rotenone, powder and liquid CONCENTRATION: 3 ppm
AMOUNT (ROTENONE AT 5% ACT. INGRED): 2,814 lbs., 15 gal.
9. METHOD OF APPLICATION: pumper boat slurry and airboat/ATV spray
10. CREW DESCRIPTION: Leader(s) Jeff Korth Personnel ~2-4

1. WATER: Annex Lakes (formerly referred to as Index Lakes, and including Shay Pond)

2. TARGET SPECIES: brown bullheads, pumpkinseed sunfish, possibly yellow perch
3. DATE LAST REHABED: October 1998
4. PROPOSED TREATMENT DATE: September-November, 2006
5. REPLANTING DATE: Spring 2007
6. SPECIES: rainbow trout, brown trout
7. CATCHABLES: 200 FINGERLINGS: 5,000
8. PROPOSED TOXICANT: Rotenone, powder and liquid CONCENTRATION: 3 ppm
AMOUNT (ROTENONE AT 5% ACT. INGRED): 1,718 lbs., 60 gal.
9. METHOD OF APPLICATION: pumper boat slurry and airboat/ATV spray
10. CREW DESCRIPTION: Leader(s) Jeff Korth Personnel ~2-4

TOTAL PROPOSED TOXICANT: Rotenone CONCENTRATION: 3 ppm

AMOUNT (ROTENONE AT 5% ACT. INGRED): 50,793 lbs. powder and 120 gal. liquid.

II. PURPOSE:

The Washington Department of Fish and Wildlife (DFW) provides many types of fisheries in response to public desires. DFW manages both trout and warmwater recreational fisheries based on many different species of fish and levels of difficulty. Public demand for and participation in opening day trout fisheries is very high. These fisheries are prized as opportunities for families to recreate together as well as providing an appropriate challenge for occasional or novice anglers. Opening day trout fisheries are also integral to the state and many local economies.

Warden and South Warden lakes have a history of being managed as trout fisheries over the last 50 years. Only the complete rehabilitation or the stocking of catchable-sized fish can restore the trout fishery in these waters now. Rehabilitation will eliminate or drastically reduce inter-specific competition and predation, allowing the trout fingerlings to flourish. The cost of annually stocking of catchable-sized trout and creating a mixed species fishery would be an order of magnitude greater for the larger trout necessary to attract anglers. Without a very significant capital investment, current resources are not available to provide catchable-sized trout on a regular basis without severely impacting hatchery production for many other fisheries. Managing these waters as warmwater fisheries will not create the same amount of recreation, as evidenced by the decline in participation as the trout fishery ebbs.

The current management of Warden and South Warden lakes as opening day trout fisheries requires the periodic rehabilitation of these waters. Warden and South Warden lakes have been rehabilitated many times. Complete kills are difficult to attain in such large, deep bodies of water, but populations of undesirable species can be reduced to the point that trout fisheries are again economical to sustain for 6 to 8 years. The management plan for both waters lists periodic rehabilitation as a tool for controlling populations of competing fishes, and DFW policy states that lake rehabilitation is an option for eliminating illegally planted fish.

III. INTENDED OUTCOME/MEASURE OF SUCCESS:

DFW intends to restore Warden and South Warden lakes to popular, easily accessible opening day trout fisheries based on fingerling-stocked trout. The average catch rates should be at least three to four 10-12 inch trout per angler. Success will be measured during annual creel surveys. Given a reasonable chance of reducing the populations of undesirable species dramatically, the beneficial effects should last approximately 6 to 8 years under current management schemes. In addition to reasons listed under Resource, Recreational and Economic Impacts, to abandon these lakes as trout fisheries is to invite other incursions across the state.

IV. RESOURCE IMPACTS:

1. The populations of the target species, which are exotic species in Washington, will be severely and negatively impacted. Complete kills of any of the target species are unlikely.
2. Regional and District Habitat, Wildlife and Non-Game managers have been apprised of our rehabilitation plans. No unmitigated concerns have been expressed on the potential impacts to non-targeted species.

According to Bradbury (1986), the effects of rotenone on benthos are variable, depending on the concentrations and species. Crustaceans are most tolerant while the smaller insects are most affected. Immediate reduction of populations averages 25%, and survival doubles when access to bottom sediments exists. Benthic communities generally recover to at least pretreatment levels within two months. Zooplankton is more severely impacted, and communities generally take two to twelve months to fully recover. While relatively tolerant of even heavy doses of rotenone, amphibians (especially larval) are at risk, and herptiles are affected somewhat less so. Almost no chance of eliminating an entire population exists.

3. Water withdrawal from the lake for irrigation will be halted until the rotenone has degraded below levels detectable by bioassay (trout survive in the water for 48 hrs). Most irrigation will have ceased for the season by the time treatment occurs. These waters are not a source of potable water for humans. A portion of the waters treated are sources of drinking water for livestock. The product label does not restrict livestock watering at allowable concentrations of use, and the levels of rotenone used in this treatment (3 ppm) are lower than the maximum allowable (4 ppm).

The lakes will be closed to angling and retention of fish during the treatment and until the season reopens the following spring. The following year's opening day fishery will occur as planned with an early plant of catchable sized rainbow. Other recreational uses such as hunting, boating, and swimming will be curtailed during the planned period of treatment (2-3 days, probably early or late Oct). Most of these activities would be limited by cold temperatures by the time treatment occurs.

Probably the largest resource impact to near-lake residents will be the dead fish accumulating along the shoreline. Besides aesthetic concerns, some odor may occur depending on the weather following the rehabilitation. Exactly where and how many dead fish accumulate will also depend on the weather, particularly wind speed and direction.

4. Professional biologists and other naturalists have visited this site frequently over the past 50 years. To our knowledge, no endemic, rare, threatened or otherwise listed species will be significantly impacted by the rehabilitation.

V. MITIGATING FOR ADVERSE IMPACTS:

1. Because rotenone will not kill fish in the egg stage, WDFW rehabilitates lakes during spring or fall to avoid the spawning seasons of the fish typically targeted. Spring rehabilitations are also chosen take advantage of the cold water, which lengthens the period during which the lake remains toxic. This results in more time for the rotenone to mix throughout the lake, resulting in a better kill. Initial treatments of Warden Lake occurred in the spring in order to avoid impacting downstream resources. Irrigation flows through an adjacent lateral canal delivered another 20 cfs of water at the lake's outlet at this time, which dilutes the treated water so that rotenone residues are below toxic levels for most fish. Unfortunately, water temperatures frequently approached 40 F, the lower limit for the spawning of any remaining perch.

The last rehabilitation of Warden Lake was done in the fall of 1998 to avoid the perch spawn. As there appears to be a good chance that perch were eliminated during that treatment, the current rehabilitation proposal will also be for the fall of 2005, sometime during September, October, or November, to be sure any remaining perch are eradicated. Bullhead spawning should also have ceased. While not likely, sunfish may still spawn during this time; however, the eggs of this species hatch in a few days, and the lake would still be sufficiently toxic to destroy any resulting progeny. The deeper portions of large lakes are also often anoxic during the fall, and these conditions will add to the stress of fish attempting to escape into the depths of the lake.

2. The outlet will be blocked at the culvert on O'Sullivan Dam Road as long as possible (about three weeks at last treatment) to contain treated water until sufficiently detoxified to an estimated 0.1 ppm or less (0.3 ppm maximum). WA DOT and East Irrigation District will be apprised of these plans. At the time of lake water release, outflow toxicity will be monitored via bioassay. Irrigation return flows in the lateral canal adjacent to the lake's outlet will still deliver sufficient flow (~ 4 cfs) to dilute any treated water to less than 0.05 ppm (0.15 maximum). Oxygenation at a downstream falls would further decrease toxicity before the treated water entered Lind Coulee, where flows in excess of 20 cfs would quickly dilute any remaining rotenone below normally detectable levels. If the level water backed up against the road be at the outlet begins to exceed the level allowed by WA DOT, water will be released immediately. Detoxification will occur if necessary.

3. Provided catchable-sized fish are available the following spring, no loss of recreational fishing time will occur. Trout fingerling survival and growth will be greatly enhanced, and future trout fisheries will attain their previous status. No removal of dead fish is planned as the nutrient base contained therein enhances the productivity of the lake. A season extension from early September until the time of treatment and dropping the daily limit will be sought to allow harvest of as many of the remaining desirable fishes as possible by the public.

4. Livestock use of the waters to be treated will not be significantly affected. The concentration of rotenone used in the treatment will be far below that considered harmful to mammals. The landowners will be notified of the rehabilitation and consequent exposure of livestock to rotenone.

5. Fall rehabilitation will not interfere with waterfowl spring nesting. The eradication of spiny-ray fishes would also benefit waterfowl through increased production of invertebrates. Stocked populations of trout will not be anywhere near as numerous as the current spiny-ray population.

The treatment will either occur before waterfowl hunting season opens or will be timed to interfere as little as possible with hunters utilizing these waters.

Most cormorants typically migrate west during October, and few are expected during the proposed treatment. Any cormorants still utilizing the lake will be displaced to other near-by waters. No other endemic, rare, threatened or otherwise listed species are known to inhabit this area during the time proposed for this treatment.

6. Protective wear for the eyes, face and hands will be available for all purveyors of rotenone. Superior techniques and equipment not available during previous rehabilitation attempts will be employed during this rehabilitation, further increasing the chances for success.

7. All landowners will be notified of the treatment, and access to the lakes will be posted during treatment according to Department of Ecology NPDES guidelines. Water withdrawals, swimming, possessing or consuming dead fish will cease during the period of toxicity.

VI. RECREATIONAL IMPACT: ALSO SEE PROPOSAL I.A.

Recreational opportunity will be increased. When free of competing species, these lakes may be conservatively estimated to provide at least 4,000 angler trips during the usual angling season. The lakes could sustain three to five times that amount of pressure if the anticipated levels of success are continued and anglers gain confidence in these waters once again.

Angler success should reach three to five fish per trip. Yearling trout should average about 11 inches. Carryovers should be expected to be about 10% of the catch and average 14-16 inches for 2-year-olds and 16-18 inches for 3-year-olds.

VII. ECONOMIC IMPACTS:

An estimated 4,000 trips made to these lakes as a result of the proposed management action would result in an increased economic impact totaling \$151,160 per year (1991 dollars; based WDW estimate of \$37.90 per trip). If used to its full potential, the annual value could be over \$600,000 to the state's economy. The fishery as it now exists generates maybe \$20,000 per year and will continue to decline. Rehabilitation would bring back the fishery and associated economic activity.

The total annual costs to stock these lakes with fingerlings is roughly \$8,000. The rehabilitation as proposed will cost the Department about \$100,000 (including costs of rotenone, time, travel). This is about three times as expensive as past treatments of this water due to the excessive amount of rotenone necessary to eradicate bullheads (3 ppm proposed compared to 1 ppm in the past to eradicate perch). If this rehabilitation provides a fishery for at least five years, the cost including fingerling plants (5 yrs.) and the rehabilitation totals \$140,000. The cost of stocking catchable-sized trout, if this were possible (see IA), would be over \$160,000 for this five-year period, and the quality of the fishery would be diminished due to the smaller, less desirable condition of the yearlings. The economic impact due this fishery, whether stocking fingerlings or catchables, over five years is at least \$750,000 and as much as \$3,000,000 to the state's economy.

VIII. RELATED MANAGEMENT ACTION:

See I.C.6. for fish planting data

IX. PUBLIC CONTACT:

A public hearing was held in Ephrata and in Olympia to explain Region Two 2005-06 rehabilitation proposals, assess public opinion, and address local concerns. The announcement was provided statewide and to area papers and radio stations and hand delivered or mailed to landowners and residents near the lakes.

The public meeting in Ephrata was held at 6 pm on July 13, 2006 at the Ephrata High School. Twenty-seven members of the public attended including at least one newspaper reporter. Local residents, primarily from Blue Lake, made up the majority of those present. After DFW's presentation explaining rehabilitations in general and the current proposals, eleven people provided comment. No comment concerning the proposal to rehabilitate Warden Lakes was provided. The public meeting in Olympia was held at 7 pm on July 19, 2006 at the Dept of Natural Resources Building. No one from the public attended. No other comment has been received to date via letters, e-mails, or calls.

With approximately 50% of the lake's users living outside Grant County, actual percentages pro and con are difficult to obtain. Public support may be best judged by the number of participants in the fishery (vis a vis Recreational Impacts).

Comments on the SEPA for rehabilitations statewide will also be accepted during the month of August. The SEPA can be found on WDFW or WA Dept of Ecology's web sites, or at County offices (usually Planning Commission). Additional comments may be sent directly to WDFW via mail or e-mail.

Initiated by: Region Two Fisheries Management

LAKE MANAGEMENT PLAN

Updated July 2006 – J. Korth

Water(s): Park Lake

Location: Sun Lakes Area, Sec 10, 11, 12, 14, 15, 16 T24N R27E; approximately 18 miles north of Ephrata and 7 miles south southwest of Banks Lake, Grant County, WA
Mucode: BAOKMQ, WRIA#: 42,

PHYSICAL INFORMATION:

1. Elevation: 1,096 ft. Avg/Max Depth: 30/85 ft. Acres: 342
Acre-feet: 13,049 Weight of water: 35,468,875,000 lbs.
2. Land Ownership: Public 40% DOT, State Parks; Private 60%;
Land Use: Residential 10% (10+? near-shore homes), Private-Recreational 50%
3. Public Access, Type and Condition: Sun Lakes State Park boat launch, parking, toilets, camping, swimming; well maintained. Most of DOT land accessible by car for shoreline angling; camping allowed; no services or maintenance.
Resorts: Two well-developed resorts with cabins, camping, launches, stores, and boat rentals.
4. INLET STREAM: small creek from Vic Meyers, joined by creeks from Delaney Springs and Deep lakes; Mirror Lake, a shallow, wide spot in the creek just above Park Lake, will also be treated as part of the inlet system; 5-10 cfs; ~ ½ mile.
5. OUTLET STREAM: perennial to Blue Lake; 5-10 cfs; ~ 175 m.
7. Habitat Description: Park Lake is primarily pelagic, and at least half the shorelines are steep and rocky. Shallow littoral areas are mainly limited to the north and south ends of the lake, comprising about 20% of the total lake surface. Aquatic vegetation (*Chara* sp.?) covers the bottoms of these littoral areas almost completely, and rushes and cattail surround about 50% of these shorelines. Park Lake has become more mesotrophic, especially in the north and south ends.
8. Water Chemistry: pH 9.8-7.8, Specific Conductance 466-518 micromhos.

GENERAL MANAGEMENT INFORMATION:

1. Current Regulations: General season opener on last Saturday in April; closes September 30. Daily limit 5 trout. Statewide regulations for all other species.
2. Stocking: 130,000 rainbow trout fry, usually Spokane stock;
10-20,000 brown trout, Ford stock.
3. Present fish population: rainbow trout, brown trout, yellow perch, largemouth bass, smallmouth bass, pumpkinseed sunfish, bluegill, brown bullheads, sculpins.
4. Anadromous fish use: none.

Management History Summary:

Park Lake has been one of the most popular trout fisheries in Washington since the 1950s. When free from competing species, the fishery produced in Park Lake supports up to 4,000 angler trips on opening day alone. Even when the fishery is diminished and the lake in need of rehabilitation, over 1,000 angler trips occur on opening day. Only about 10% of these anglers are from the local area, while 50% come from the westside of the state.

Management intent has been to produce daily limits of about 12-inch yearling rainbow on opening day, with enough fish remaining thereafter to carry the season through early summer.

Stocking records for rainbow trout go back at least to 1953. Early stocking rates were 200,000 or more fish, but were adjusted to current rates during the 1980's. Besides rainbow, coho have also been planted with some success. Eastern brook trout have been tried sporadically. Brown trout were introduced in 1987, with the hope of controlling competing spiny-rayed fishes. The browns have at least added the occasional lunger to the creel and are a source of some excitement. Most fish are stocked during the spring as fry. When competing species begin to adversely affect spring fry survival, fall plants of advanced fry have helped sustain the fishery. Catchables have generally been used to provide a fishery the season before and after rehabilitation occurs.

Lake rehabilitation with rotenone has been a standard and successful management tool for Park Lake since its earliest days as a fishery. Rehabilitations of the entire lake have averaged about every 5-6 years and occurred in 1952, 1959, 1963, 1976, 1981, 1986, and 1996. Partial rehabilitations of the shorelines to control sunfish were done during the late 1960s and early 1970s with some success as indicated by the 13 years between complete rehabs during that time.

Park Lake has generally followed the regulations applied to April opening day waters statewide. Focus is on the harvest of yearling fish. No minimum size is established, and bait is allowed. Daily limits were 8 fish until 1994, when the limit was reduced to 5 fish in an attempt to prolong successful angling during the spring and early summer.

Park Lake closes at the end of September to protect the cohort planted the previous spring, which would provide the next year's fishery. During the years through 1993, the lake was open to special regulations, catch and release angling during October. This fishery was instituted at the Commission's request. Since this fishery would be for fish planted the spring of the same year, the fish were still fairly small. The intended fishery never materialized.

Management Issues Summary:

The increasing population of Washington has been the primary issue with managing Park Lake. The crowds of anglers continue to increase. Anglers from the westside of the state who have been displaced from their abandoned traditional fisheries on opening day or closed anadromous fisheries are becoming more numerous at Park Lake. The local population is growing as well. Sun Lakes State Park is the second most visited State Park in Washington. Angling also conflicts with other lake users such as skiers and boaters, especially from Memorial Day to Labor Day.

The introduction, mostly illegally, of exotic species deleterious to the management of trout is the most serious challenge to the management Blue Lake. Competition from yellow perch and sunfish combined with predation by small and largemouth bass severely impact trout fingerling survival. Managing with trout fingerlings thus requires periodic chemical rehabilitation to eradicate the majority of the spiny-rayed fishes. Current hatchery space and water is inadequate to produce the number of catchable-sized trout required to create the same fishery. Net pens would not produce large enough fish by the opener.

Rehabilitation proposals may be met with some argument due the preceding discussions. The environmental effects of rotenone use will also no doubt be invoked. The resistance at Park Lake should not be as strong as that for near-by Blue Lake, as Park Lake has many fewer shoreline residences.

A more recent management issue for this water has been the increasing number of piscivorous birds frequenting the area. While no uncontested proof of damage to the fishery exists, these species are primarily fish eaters. Loons have been observed during the fall. Mergansers and even a few cormorants have become summertime residents on Blue Lake. It is suspected that the height of their impact to the fishery has yet to be seen.

T&E Flora and Fauna: Professionals from many resource fields have visited this site countless times during the last 40 years. No known report exists of any threatened or endangered species habitually found in or near Blue Lake. Occasional visits from both bald and golden eagles occur, although no nests of these two species are known in the area. Protected species of waterfowl and other birds frequently are found here at times, as well. No significant nesting of any of these species occurs.

Current Management Objectives: Park Lake

Last Saturday in April through September 30, production type trout fishery. Five fish limit, no size or gear restrictions. Provide 4+ yearling 12-inch rainbow trout per angler trip for 2-4,000 anglers on opening day, and 3 trout per angler average for the remaining part of the season for at least 20,000 additional angler trips. Park Lake could sustain well over 25,000 angler trips per year when relatively free of competing or predacious species.

1. Fishery Objectives:

<u>Species</u>	<u>Type</u>	<u>Category</u>	<u>Number of Fish</u>		<u>Avg. Size</u>	<u>Exploit.</u>
			<u>/hour</u>	<u>/Angler</u>		<u>Rate</u>
Rainbow	Prod	Opener	3	5	12 inches	10% plant
		After	1-2	3	12-15 in.	95% plant

2. Angler use objective (#angler days): Opener - 4,000; Season - 20,000

3. Stocking Objectives:

Post rehabilitation, first year, catchables for first year's season in addition to fingerlings;

<u>Species</u>	<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	<u>Planting Month</u>
Rainbow	60,000	180	2-3	March-April

- minimum number to produce 3 fish/angler average opening day catch

Brown Trout	5-10,000	5-10	2-3	May
-------------	----------	------	-----	-----

- give browns head start in growth to be predators on spiny-rayed fishes and provide a little variation in the catch.

Post rehabilitation, first ~ 5 years

<u>Species</u>	<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	<u>Planting Month</u>
Rainbow	130,000	375	80-100	May
Brown Trout	5-10,000	10-20	50-100	May

Post rehabilitation, ~ year 6-10; split fingerlings to reduce intraspecific competition

<u>Species</u>	<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	<u>Planting Month</u>
Rainbow	65,000	180	80-100	May
Rainbow	65,000	180	10-20	October
Brown Trout	5,000	10-20	50-100	May

- continue brown trout fingerlings, if available, until yearling recruitment is poor.

Post rehabilitation, ~ year 7-10, increasing catchables as available and as both spring and fall fingerling recruitment decline; in addition to fingerlings;

<u>Species</u>	<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	<u>Planting Month</u>
Rainbow	15-30,000	40-90	2-3	March-April

4. Management Strategy (including regulations):

- Plant rainbow fry in spring for following year's production; after opener if possible to avoid nuisance and mortality of fingerlings caught opening day.
- Maintain statewide April opener regulations.
- Harvest 95% of plant or available fish by end of season.
- Monitor fishery via Brown's Opening Day Model.
- Monitor all fish species periodically by electrofishing or netting.
- Begin stocking 50% of fry during the fall at 10-20/lb. when spiny-ray species begin impacting spring fry survival (about 6th year post-rehabilitation).
- Control spiny-ray species with rotenone when survival of spring and fall plants is inadequate to produce an acceptable fishery.
- Stock catchables as available during the 3-5 years previous and the year after rehabilitation.
- Native Species/Stocks/Habitats Needing Special Protection: None.

LAKE MANAGEMENT PLAN

Updated July 2006 – J. Korth

Water(s): Blue Lake

Location: Sun Lakes Area, Sec 20, 21, 29 T24N R27E; approximately 15 miles north of Ephrata and 10 miles south southwest of Banks Lake, Grant County, WA

MU Code: BEDKFW, WRIA#: 42,

PHYSICAL INFORMATION:

1. Elevation: 1,093 ft. Avg/Max Depth: 40/69 ft. Acres: 532
Acre feet: 21,353 Weight of water: 58,040,783,000 lbs.
2. Land Ownership: Public 30% DOT and WDFW, Private 70%;
Land Use: Residential 20% (200+? near-shore homes),
Private-Recreational 25%, Grazing 25%.
3. Public Access, Type and Condition: WDFW boat launch, parking, toilets; no camping; well maintained. Most of DOT land accessible by car for shoreline angling; camping allowed; no services or maintenance.
Resorts: Three well-developed resorts with cabins, camping, launches, stores, and boat rentals.
4. INLET STREAM: perennial from Park Lake; 5-10 cfs; ~ 175 m.
5. OUTLET STREAM: mostly perennial, drains to Alkali Lake, w/ water control structure and rotating drum type screen, repaired 1994; 5-10 cfs; ~ ¾ miles.
6. Habitat Description: Blue Lake is primarily pelagic, and most shorelines are steep and rocky. Shallow littoral areas are limited to the north and south ends of the lake, comprising less than 10% of the total lake surface. Aquatic vegetation (*Chara* sp.?) covers the bottoms of these littoral areas almost completely, and rushes and cattail surround about 50% of these shorelines. Secchi disk readings are about 15 to 20 feet at midday. Due to development, Blue Lake has become more mesotrophic, especially in the north and south ends.
8. Water Chemistry: pH 9.1-8.5, Specific Conductance 498-513 micromhos.

GENERAL MANAGEMENT INFORMATION:

1. Current Regulations: General season opener on last Saturday in April; closes September 30. Daily limit 5 trout. Statewide regulations for all other aspects.
2. Stocking: 200,000 rainbow trout fry, usually Spokane stock.
3. Present fish population: rainbow trout, brown trout, yellow perch, largemouth bass, smallmouth bass, pumpkinseed sunfish, bluegill, brown bullheads, sculpins.
4. Anadromous fish use: none.

Management History Summary:

Blue Lake has been one of the most popular trout fisheries in Washington since the 1950's. When free from competing species, the fishery produced in Blue Lake supports up to 6,000 angler trips on opening day alone. Even when the fishery is diminished and the lake in need of rehabilitation, over 2,000 angler trips occur on opening day. Only about 10% of these anglers are from the local area, while 50% come from the westside of the state.

Management intent has been to produce daily limits of about 12 inch yearling rainbow on

opening day, with enough fish remaining thereafter to carry the season through early summer.

Stocking records for rainbow trout go back at least to 1953. Early stocking rates were about 400,000 fish, but were adjusted to current rates during the 1960s. When the statewide daily creel limits were adjusted from eight to five fish in the mid-1990s, the stocking rate was reduced from 250,000 to 200,000 rainbow. Fewer fish per limit meant a lower overall harvest. Coincidentally or not, participation in the fishery also dropped at this time, further reducing overall harvest. Reducing the stocking rate resulted in an increased yearling size from nine inches to 12 inches. Besides rainbow, kokanee have also been planted with some success. Most fish are stocked during the spring as fry. When competing species begin to adversely affect spring fry survival, fall plants of advanced fry have helped sustain the fishery. In theory, this split release reduces intraspecific competition, which allows better growth of the spring allotment and better survival for the fall allotment. Extended rearing in the hatchery allows the fall release to be planted at a larger size. Survival of the fall-released fish is also enhanced because the activity of piscivorous fish and birds declines at that time. Catchables have generally been used to provide a fishery the season before and after rehabilitation occurs.

Lake rehabilitation with rotenone has been a standard and successful management tool for Blue Lake since its earliest days as a fishery. Rehabilitations of the entire lake have averaged about every 5-6 years and occurred in 1952, 1959, 1963, 1969, 1976, 1981, 1986, and 1996. Partial rehabilitations of the shorelines to control sunfish were done during the late 1960's and early 1970's with some success as indicated by the 7 years between complete rehabs during that time. Using the current split stocking scheme, the period between rehabilitations has been increased to 10 years.

Blue Lake has generally followed the regulations applied to April opening day waters statewide. Focus is on the harvest of yearling fish. No minimum size is established, and bait is allowed. Daily limits were 8 fish until 1994, when the limit was reduced to 5 fish in an attempt to prolong successful angling during the spring and early summer. Blue Lake closes at the end of September to protect the cohort planted the previous spring, which would provide the next year's fishery.

Management Issues Summary:

The increasing population of Washington has been the primary issue with managing Blue Lake. The crowds of anglers continue to increase. Anglers from the westside of the state who have been displaced from their abandoned traditional fisheries on opening day or closed anadromous fisheries are becoming more numerous at Blue Lake. The local population is growing as well.

The introduction, mostly illegally, of exotic species deleterious to the management of trout is the most serious challenge to the management Blue Lake. Competition from yellow perch and sunfish combined with predation by small and largemouth bass severely impact trout fingerling survival. Managing with trout fingerlings thus requires periodic chemical rehabilitation to eradicate the majority of the spiny-rayed fishes. Current hatchery space and water is inadequate to produce the number of catchable-sized trout required to create the same fishery. Net pens would not produce large enough fish by the opener.

Of special concern is the increasing amount of near lake residences. Probably most of the continuing eutrophication of Blue Lake can be attributed to run-off from the lawns and streets of the developed area on the mid-east shore of the lake. In addition, some of these residents are more concerned with the aesthetic qualities of lakeside living, and they do not particularly care whether the fishing is good. Some actually detest the opening day crowds on 'their' lake. Angling also conflicts with other lake users such as skiers and boaters, especially during and after Memorial Day.

Rehabilitation proposals can be expected to be met with vigorous argument from an as yet small portion of near-lake residents and warmwater fish enthusiasts due the preceding discussions. The environmental effects of rotenone use will also no doubt be invoked. Lacking any substance to most environmental issues, the odor of rotting fish may be used.

A more recent management issue for this water has been the increasing number of piscivorous birds frequenting the area. While no uncontested proof of damage to the fishery exists, these species are primarily fish eaters. Over 30 loons have been counted on the north end of the lake during the spring and fall migrations. Mergansers and cormorants have become summertime residents on Blue Lake. It is to be suspected that the extent of their impact to the fishery has yet to be seen.

T&E Flora and Fauna: Professionals from many resource fields have visited this site countless times during the last 40 years. No known report exists of any threatened or endangered species habitually found in or near Blue Lake. Occasional visits from both bald and golden eagles occur, although no nests of these two species are known in the area. Protected species of waterfowl and other birds frequently are found here at times, as well. No significant nesting of any of these species occurs.

Current Management Objectives: Blue Lake

Last Saturday in April through September 30, production type trout fishery. Five fish limit, no size or gear restrictions. Provide 4+ yearling 12-inch rainbow trout per angler trip for 4-5,000 anglers on opening day, and 3 trout per angler average for the remaining part of the season for at least 20,000 additional angler trips. Blue Lake could sustain well over 35,000 angler trips per year when relatively free of competing or predacious species.

1. Fishery Objectives:

<u>Species</u>	<u>Type</u>	<u>Category</u>	<u>Number of Fish</u>		<u>Avg. Size</u>	<u>Exploit.</u>
			<u>/hour</u>	<u>/Angler</u>		<u>Rate</u>
Rainbow	Prod	Opener	3	5	12 inches	10% plant
		After	1-2	3	12-15 in.	95% plant

2. Angler use objective (#angler days): Opener - 5,000; Season - 30,000

3. Stocking Objectives:

Post rehabilitation, first year, catchables for first year's season in addition to fingerlings;

<u>Species</u>	<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	<u>Planting Month</u>
Rainbow	100,000	180	2-3	March-April

- minimum number to produce 3 fish/angler average opening day catch

Brown Trout	5-10,000	5-10	2-3	May
-------------	----------	------	-----	-----

- give browns head start in growth to be predators on spiny-rayed fishes and provide a little variation in the catch.

Post rehabilitation, first ~ 5 years

<u>Species</u>	<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	<u>Planting Month</u>
Rainbow	200,000	375	80-100	May
Brown Trout	5-10,000	10-20	50-100	May

Post rehabilitation, ~ year 6-10; split fingerlings to reduce intraspecific competition

<u>Species</u>	<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	<u>Planting Month</u>
Rainbow	100,000	180	80-100	May
Rainbow	100,000	180	10-20	October
Brown Trout	5,000	10-20	50-100	May

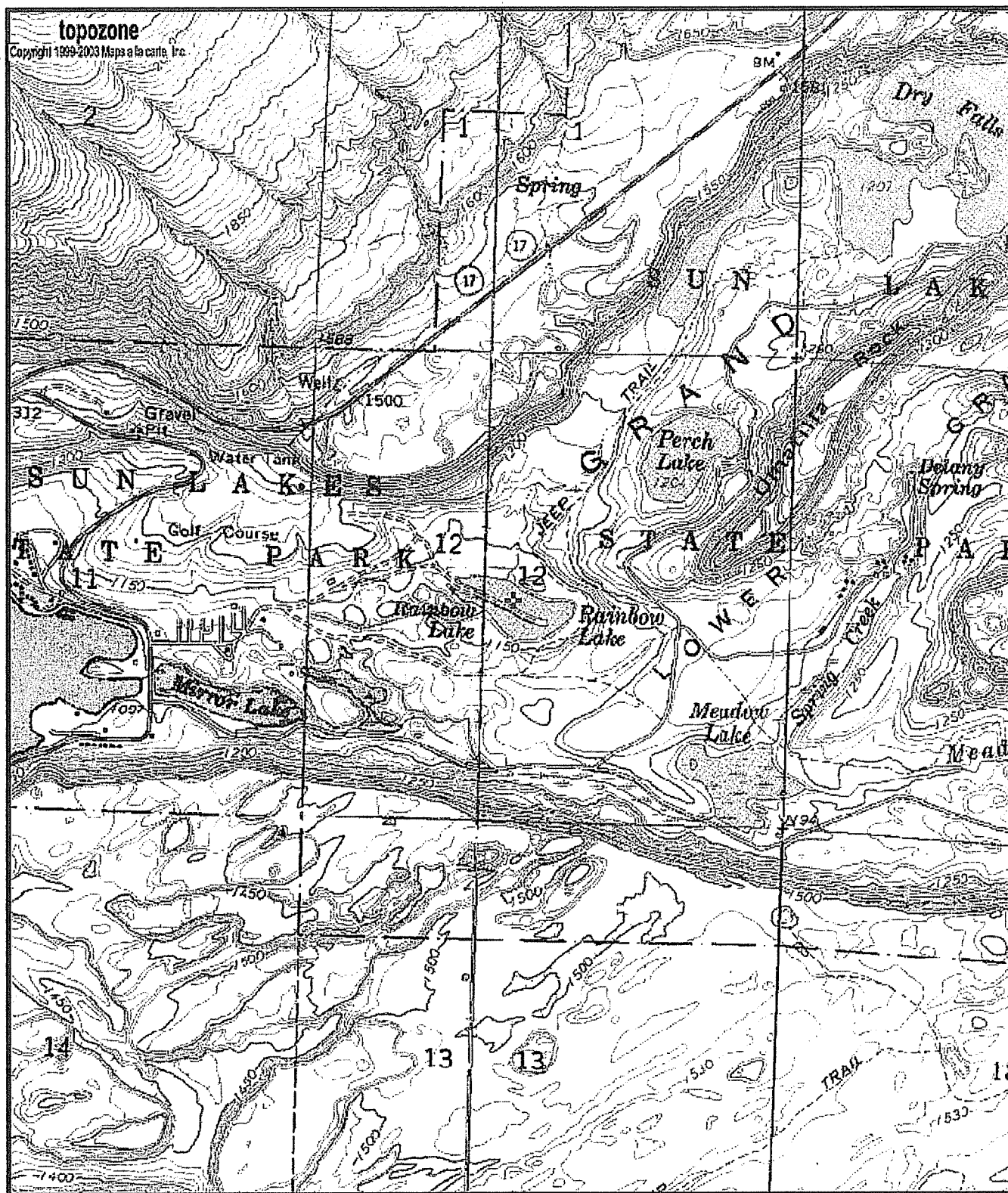
- continue brown trout fingerlings, if available, until yearling recruitment is poor.

Post rehabilitation, ~ year 7-10, increasing catchables as available and as both spring and fall fingerling recruitment decline; in addition to fingerlings;

<u>Species</u>	<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	<u>Planting Month</u>
Rainbow	20-50,000	40-90	2-3	March-April

4. Management Strategy (including regulations):

- Plant rainbow fry in spring for following year's production; after opener if possible to avoid nuisance and mortality of fingerlings caught opening day.
- Maintain statewide April opener regulations.
- Harvest 95% of plant or available fish by end of season.
- Monitor fishery via Brown's Opening Day Model.
- Monitor all fish species periodically by electrofishing or netting.
- Begin stocking 50% of fry during the fall at 10-20/lb. when spiny-ray species begin impacting spring fry survival (about 6th year post-rehabilitation).
- Control spiny-ray species with rotenone when survival of spring and fall plants is inadequate to produce an acceptable fishery.
- Stock catchables as available during the 3-5 years previous and the year after rehabilitation.
- Maintain revolving drum screen at outlet to inhibit spiny ray species from Alkali Lake entering Blue Lake.
- Native Species/Stocks/Habitats Needing Special Protection: None.



0 0.3 0.6 0.9 1.2 1.5 km
0 0.2 0.4 0.6 0.8 1 mi

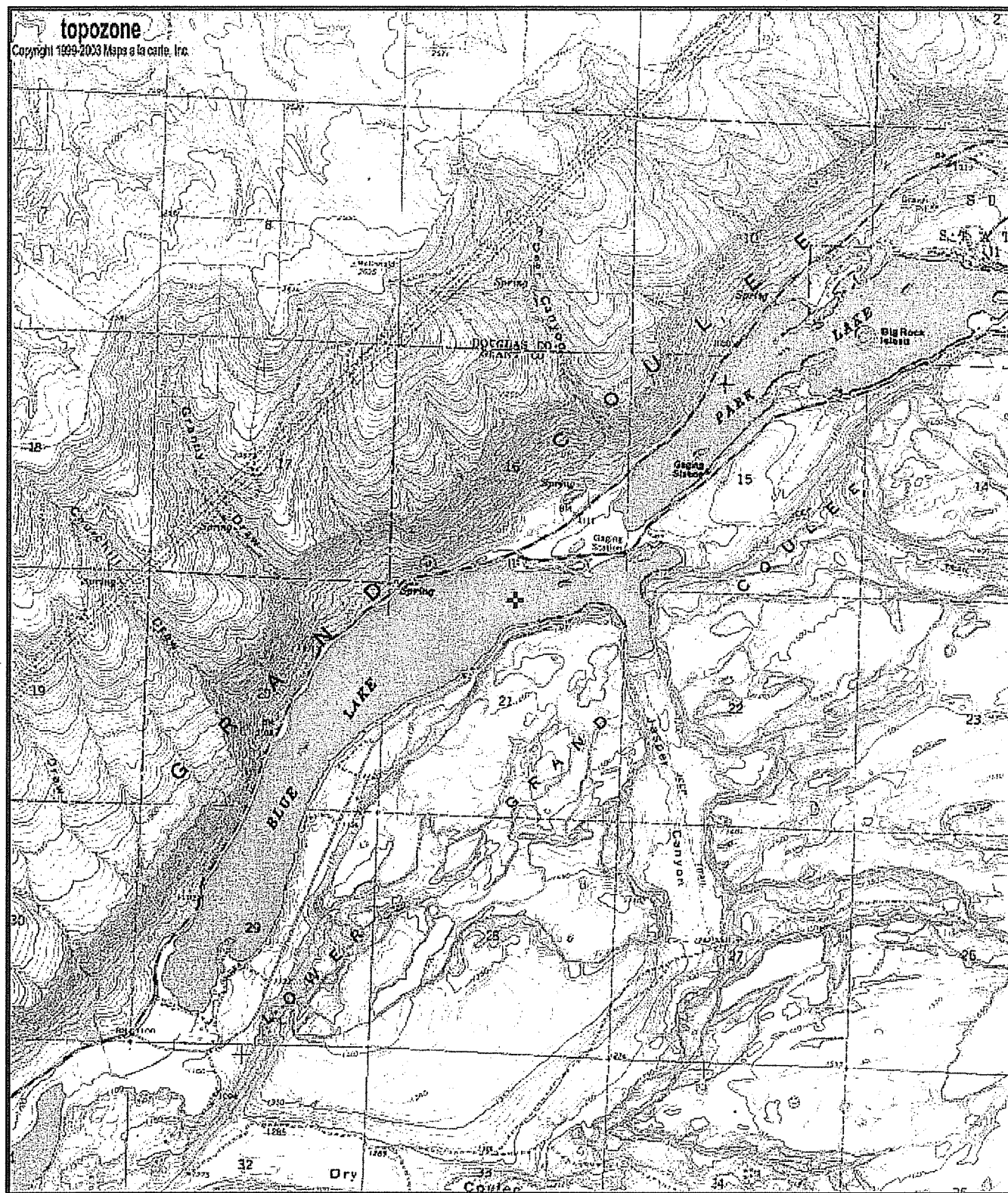
Map center is 47° 35' 29"N, 119° 22' 29"W (WGS84/NAD83)

Coulee City quadrangle

Projection is UTM Zone 11 NAD83 Datum



M=17.524
G=-1.754



0 0.6 1.2 1.8 2.4 3 km
0 0.4 0.8 1.2 1.6 2 mi

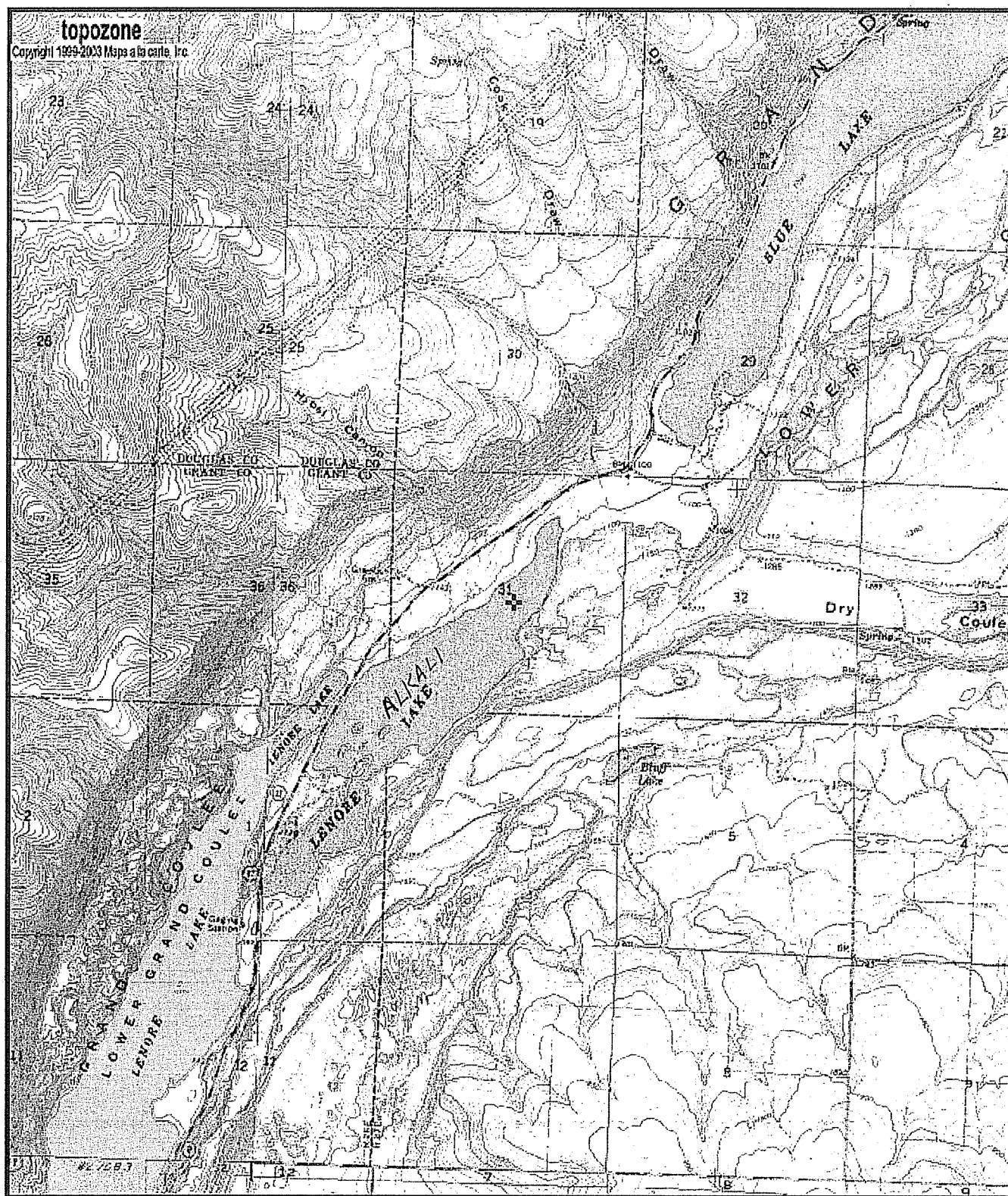
Map center is 47° 34' 10"N, 119° 26' 11"W (WGS84/NAD83)

Park Lake quadrangle

Projection is UTM Zone 11 NAD83 Datum



M=17.532
G=-1.799



0 0.6 1.2 1.8 2.4 3 km
0 0.4 0.8 1.2 1.6 2 mi

Map center is 47° 32' 02"N, 119° 28' 46"W (WGS84/NAD83)

Park Lake quadrangle

Projection is UTM Zone 11 NAD83 Datum

M
G
M=17.531
G=-1.83

PRE-REHABILITATION PLAN

BLUE AND PARK LAKES and drainages Including Vic Meyers (Rainbow), Mirror, and Alkali Lakes

I. PROPOSAL

A. Justification for Proposed Rehabilitation

Blue and Park Lakes and the associated drainages including Vic Meyers, Mirror, and Alkali Lakes are part of the Sun Lakes chain of lakes south of Banks Lake. Blue and Park Lakes are among the state's top attractions for trout angling and arguably the most important opening day waters in Grant County since the 1950s. When relatively free from competing species, the fishery produced in Blue and Park Lakes supports up to 4-6,000 angler trips on opening day alone. Only about a fourth of these anglers are from the local area, while over 50% come from the west side of the state. Four resorts and a state park cater to anglers from all of Washington. Vic Meyers (Rainbow) Lake is also an opening day trout fishery, and this small lake is especially popular with local anglers. Mirror Lake (Pond) is very small and shallow, primarily a wide spot in the connecting drainage between Vic Meyers and Park lakes. Alkali Lake is on the downstream end of the chain, and is managed for spiny-rayed fish species. It is open year around and supports a relatively low-key fishery primarily for bass and bluegill.

Poor trout survival at Blue and Park lakes was indicated by the decline in catch per angler (Table 1). The first decline in catch occurred in 2002 and was also accompanied by an abrupt jump in the size of yearling trout and increase in the percentage of carryover trout. The larger size of yearling trout and relative increase in carryover trout was an indication of declining spring fingerling survival.

Table 1. Blue and Park Lakes April opening day catch summary - 1997 – 2006.

	Catch/ angler	Avg size yearling (in.)	CO size (in.)	%	Comments
Year					
06	0.8	14.6	16-27	~ 10	catchables added, but few in catch; browns tr < 1% 20-27"; bass capture
05	3.7	12.0	15-20	5-8	catchables added; bass capture
04	4.3	11.6	16-20	1-5	catchables added
03	4.3	13.5	18-19	5	catchables added; carryover/yrly overlap
02	2.0	14.0	16+	8-9	catchables added; carryover/yrly overlap; brown tr ~ 1% 12-14" perch,bass abundant
01	4.1	12.5	15	5	brown tr ~ 1% 12-15"
00	4.2	12.3	14-15	2-3	brown tr ~ 1% 12-18"; perch, bass noted
99	4.3	11.0	13.0	10	
98	4.5	11.6	14	7	
97	3.2	10.4	catchables added		
96	Blue/Park Lakes last rehabilitated; fall 1996.				

Relatively high numbers of bass, perch, bullheads, and sunfish were also noted by 2002. Among these, a new species was present; smallmouth bass had not been present during the 1996 rehabilitation. Although catchables were added for the 2002 opener, the catch per angler was still low. The trout stocking strategy for the 2003 fishery was changed to manage around the increasing numbers of other fish species (Table 2). Half the 2002 fingerling trout allotment was stocked as usual in spring, and the remaining half held at the hatchery and stocked in the fall.

This modified stocking scheme decreases competition among the spring-stocked fingerlings and produces a larger fingerling for fall stocking. The largest yearling trout in the resulting fishery are generally from the spring plant; however, better survival is apparent from the fall plant.

The stocking modification combined with the addition of catchable-sized trout propped up the fishery for the next three years. Catch rates were once again high for the 2003 and 2004 openers. By 2005, catch rates showed signs of decline, and the numbers of bass, perch, and sunfish were very high as evidenced by the growing fisheries for some of these species and their relative numbers in the sampling by-catch. Little evidence of spring or fall fingerlings survival was seen in the early part of 2006. Catch per angler during the 2006 opener was among the lowest in Blue and Park Lakes' history, and roughly the same as 1996 just prior to the last rehabilitation. Without adequate contribution from the fingerling stocked trout, the catchables that had been added just previous to the opener were too few to contribute much to the catch.

Table 2. Blue and Park Lakes stocking summary - 1997 – 2006; all fish rainbow unless otherwise noted (br tr = brown trout; tg tr = tiger trout).

Fishery Year	Blue Lake			Park Lake		
	Spring Fingerlings	Fall Fingerlings	Catchables	Spring Fingerlings	Fall Fingerlings	Catchables
06	100,158	70,016	29,062	65,017	40,019	23,731
05	100,023	49,992	25,004	64,967	65,100	19,316
04	100,275	90,180	35,263	64,978	55,002	35,041
03	100,000	100,000	55,000	65,000	55,830	30,000
02	199,919		24,000	129,854		7,000 tg tr 25,000
01	187,292	4,950 br tr	2,300 br tr	178,024	4,614 br tr	1,503 br tr
00	232,465	4,998 br tr	5,002 br tr	156,973	4,998 br tr	5,000 br tr
99	200,069	10,097 br tr		152,148	10,027 br tr	4,000 br tr
98	201,996	10,003 br tr		120,150	14,036 br tr	
97			103,189			63,100
96	Blue/Park Lakes last rehabilitated; fall 1996.					

Spring Fingerlings @ 60-100/lb 2-3 inches average; stocked one year before fishery
 Fall Fingerlings @ 10-20/lb 5-7 inches average; stocked six months before fishery
 Catchables @ 2-4/lb 8-11 inches average; stocked one to two months before fishery

Lake rehabilitation with rotenone has been a standard and successful management tool for Blue and Park Lakes since their earliest days as a fishery. Rehabilitations of the entire lakes have occurred in 1952, 1959, 1963, 1969, 1976, 1981, 1986, and 1996. Treatments averaged about every 5-6 years through 1986. The spring-fall fingerling stocking strategy described earlier and started in the mid-1990s has successfully extended the fishery another three to four years so that rehabilitations have only been necessary every 9-10 years. It has now been 10 years since the last rehabilitation of Blue and Park Lakes. Survival of both spring and fall fingerling trout has diminished to the point that these cohorts cannot meet the fishery expectations of the public. The effects of competition and predation due to expanding populations of spiny-rayed fishes have depressed trout survival and angler success dramatically in 2006.

The invasion of the drainage upstream of Park Lake by the same spiny-ray species makes treatment of these waters desirable not only to recover the fishery in Vic Meyers Lake, but also to delay the inevitable return of these species to Park and Blue lakes. The management plan for Alkali Lake emphasizes the bass and bluegill as the primary fisheries. The numbers of pumpkinseed sunfish and yellow perch in Alkali Lake have increased substantially and are considered detrimental to the primary management goals. Since large numbers of these fish are found in the shallow, northern portion of the lake, allowing treated water from Blue Lake to infiltrate this area should reduce the population of these species. A complete kill of Alkali Lake is not anticipated.

Alternatives to rehabilitation are far more costly. To maintain a comparable fishery in Blue and Park Lakes with catchable-sized fish would take at least 200,000 catchable rainbow. The District's entire normal allotment of catchable trout for all waters is currently only 110,000 fish. Region Two lacks the hatchery space and water to institute a catchable fish- stocking program as a substitute for lake rehabilitation. If hatchery space and water were available, stocking catchable-sized fish still costs almost ten times the cost of stocking fingerlings. Given the demands on hatchery space, the lake-raised yearling trout are larger and better quality than the hatchery-reared catchable trout.

B. Physical Description of Water Proposed for Rehabilitation (upstream to lower):

1. WATER: Vic Meyers (Rainbow) Lake

2. LOCATION: Sec 12, T24N R27E, Grant Co.
3. SURFACE ACRES: 12 MAXIMUM DEPTH: 15 feet
4. VOLUME: 120 acre-feet; 326,177,280 lbs water
5. INLET STREAM: subterranean flow, main spring in southeast arm of lake; ~ 2-5 cfs.
6. OUTLET STREAM: perennial to Park Lake; , joined by creeks from Delaney Springs and Deep lakes; 5-10 cfs; ~ 175 m.
7. PUBLIC ACCESS: Sun Lakes State Park; primitive boat launch, parking, toilets, camping.
8. LAND OWNERSHIP: Public 100% State Parks.
9. ESTABLISHED RESORTS: none on lake.

1. WATER: Park Lake

2. LOCATION: Sec 10, 11, 15 T24N R27E, Grant Co.
3. SURFACE ACRES: 342 MAXIMUM DEPTH: 85 feet
4. VOLUME: 13,049 acre-feet; 35,468,875,000 lbs water
5. INLET STREAM: small creek from Vic Meyers, joined by creeks from Delaney Springs and

Deep lakes; Mirror Lake, a shallow, wide spot in the creek just above Park Lake, will also be treated as part of the inlet system; 5-10 cfs; ~ ½ mile.

6. OUTLET STREAM: perennial to Blue Lake; 5-10 cfs; ~ 175 m.

7. PUBLIC ACCESS: Sun Lakes State Park boat launch, parking, toilets, camping, swimming; well maintained. Most of DOT land along Hwy 17 is accessible by car for shoreline angling; camping allowed; no services or maintenance.

8. LAND OWNERSHIP: Public 40% DOT, State Parks; Private 60%;

9. ESTABLISHED RESORTS: Two well-developed resorts with cabins, camping, launches, stores, and boat rentals.

1. WATER: Blue Lake

2. LOCATION: Sec 20, 21, 29, T24N R27E, Grant Co.

3. SURFACE ACRES: 532. MAXIMUM DEPTH: 69 feet

4. VOLUME: 21,353 acre-feet; 58,040,783,000 lbs water

5. INLET STREAM: perennial from Park Lake; 5-10 cfs; ~ 175 m.

6. OUTLET STREAM: mostly perennial, drains to Alkali Lake, w/ water control structure and rotating drum type screen, repaired 1994; 5-10 cfs; ~ ¾ miles.

7. PUBLIC ACCESS: WDFW boat launch, parking, toilets; no camping; well maintained. Most of DOT land along Hwy 17 accessible by car for shoreline angling; camping allowed; no services or maintenance.

8. LAND OWNERSHIP: Public 30% DOT and WDFW; Private 70%;

9. ESTABLISHED RESORTS: Three well-developed resorts with cabins, camping, launches, stores, and boat rentals.

1. WATER: Alkali Lake

2. LOCATION: Sec 36 T24N R26E, and Sec 1 T23N R26E, Grant Co.

3. SURFACE ACRES: 293 MAXIMUM DEPTH: 14 feet

4. VOLUME: 2,449 acre-feet; 6,656,375,000 lbs water

5. INLET STREAM: mostly perennial, from Blue Lake, w/ water control structure and rotating drum type screen, repaired 1994; 5-10 cfs; ~ ¾ miles.

6. OUTLET STREAM: intermittent creek to Lake Lenore; dry during fall/winter; flows through rock fill under Hwy 17; 0-10 cfs; ~ 40 m.

7. PUBLIC ACCESS: WDFW boat launch, parking, toilets, camping.

8. LAND OWNERSHIP: Public 50% DOT and WDFW; Private 50%;

9. ESTABLISHED RESORTS: None

C. Proposed Management Actions (upstream to lower)

1. WATER: **Vic Meyers Lake** (including outlet to Park Lake)
2. TARGET SPECIES: yellow perch, pumpkinseed sunfish, brown bullheads, and sculpins.
3. DATE LAST REHABED: November 3, 1986
4. PROPOSED TREATMENT DATE: October-November, 2006
5. REPLANTING DATE: Spring 2007
6. SPECIES: rainbow trout; CATCHABLES: 2,000 (~175-200/acre)
FINGERLINGS: 4,000 (~350-400/acre)
7. PROPOSED TOXICANT: Rotenone, powder and liquid; CONCENTRATION: 4 ppm
AMOUNT (ROTENONE AT 5% ACT. INGRED): 1,300 lbs. powder, 60 gal. liquid.

1. WATER: **Park Lake**
2. TARGET SPECIES: yellow perch, pumpkinseed sunfish, largemouth bass, smallmouth bass, brown bullheads, bluegill, and sculpins.
3. DATE LAST REHABED: November 1, 1996
4. PROPOSED TREATMENT DATE: October-November, 2006
5. REPLANTING DATE: Spring 2007
6. SPECIES: rainbow trout; CATCHABLES: 60,000 (~175-200/acre)
FINGERLINGS: 120,000 (~350-400/acre)
7. PROPOSED TOXICANT: Rotenone, powder and liquid; CONCENTRATION: 1 ppm
AMOUNT (ROTENONE AT 5% ACT. INGRED): 35,100 lbs. powder, 30 gal. liquid.

1. WATER: **Blue Lake**
2. TARGET SPECIES: yellow perch, pumpkinseed sunfish, largemouth bass, smallmouth bass, brown bullheads, bluegill, and sculpins.
3. DATE LAST REHABED: October 30-31, 1996
4. PROPOSED TREATMENT DATE: October-November, 2006
5. REPLANTING DATE: Spring 2007
6. SPECIES: rainbow trout; CATCHABLES: 100,000 (~175-200/acre)
FINGERLINGS: 200,000 (~350-400/acre)
7. PROPOSED TOXICANT: Rotenone, powder and liquid; CONCENTRATION: 1 ppm
AMOUNT (ROTENONE AT 5% ACT. INGRED): 57,500 lbs. powder, 30 gal. liquid.

For **all** of the above listed waters and drainages:

1. METHOD OF APPLICATION: pumper boats and slurry, airboat, canoe, and ATV with electric pumper spray will be used where suitable
2. CREW DESCRIPTION: Leader(s) Jeff Korth Personnel ~ 12

1. WATER: **Alkali Lake**
2. TARGET SPECIES: yellow perch, pumpkinseed sunfish
3. DATE LAST REHABED: October 1996
4. PROPOSED TREATMENT DATE: partial treatment, October-November, 2006
5. REPLANTING DATE: no stocking planned
6. PROPOSED TOXICANT: Rotenone, powder and liquid; CONCENTRATION: 1 ppm or less; concentration dependent on outflow from Blue Lake; no other rotenone added.

TOTAL PROPOSED TOXICANT: Rotenone CONCENTRATION: 1 ppm
AMOUNT (ROTENONE AT 5% ACT. INGRED): 93,900 lbs. powder and 120 gal. liquid.

II. PURPOSE:

The Washington Department of Fish and Wildlife (DFW) provides many types of fisheries in response to public desires. DFW manages both trout and warmwater recreational fisheries based on many different species of fish and levels of difficulty. Public demand for and participation in opening day trout fisheries is very high. These fisheries are prized as opportunities for families to recreate together as well as providing an appropriate challenge for occasional or novice anglers. Opening day trout fisheries are also integral to the state and many local economies.

Blue and Park Lakes have a long and storied history as lowland lake trout management waters. Both waters are among the most known and visited opening day waters in the state. Many generations of anglers have started angling careers on these waters and continue to enjoy the social aspects of opening day on these waters.

Only the complete rehabilitation or the stocking of catchable-sized fish can restore the trout fishery in Park and Blue Lakes now. Rehabilitation will eliminate or drastically reduce inter-specific competition and predation, allowing the trout fingerlings to flourish. The cost of annually stocking of catchable-sized trout and creating a mixed species fishery would be an order of magnitude greater for the larger trout necessary to attract anglers. Without a very significant capital investment, current resources are not available to provide catchable-sized trout on a regular basis without severely impacting hatchery production for many other fisheries. Managing these waters as warmwater fisheries will not create the same amount of recreation, as evidenced by the decline in participation as the trout fishery ebbs.

The current management of Blue and Park lakes as opening day trout fisheries requires the periodic rehabilitation of these waters. Blue and Park Lakes have been rehabilitated many times. Complete kills are difficult to attain in such large, deep bodies of water, but populations of undesirable species can be reduced to the point that trout fisheries are again economical to sustain for 8 to 10 years. The management plan for both waters lists periodic rehabilitation as a tool for controlling populations of competing fishes, and DFW policy states that lake rehabilitation is an option for eliminating illegally planted fish.

III. INTENDED OUTCOME/MEASURE OF SUCCESS:

DFW intends to restore Blue, Park, and Vic Meyers lakes to popular, easily accessible opening day trout fishery based on fingerling-stocked trout. The average catch rates should be at least three to four 10-12 inch trout per angler. Participation of 4,000 to 6,000 anglers on opening day is anticipated. Success will be measured during annual creel surveys. Given a reasonable chance of reducing the populations of undesirable species dramatically, the beneficial effects should last approximately 8 to 10 years under current management schemes. In addition to reasons listed under Resource, Recreational and Economic Impacts, to abandon these lakes as trout fisheries is to invite other incursions across the state. The reduction of numbers of pumpkinseed sunfish and yellow perch in Alkali Lake is also anticipated. An increase in the relative density and size of the desired species (bluegill, bass) should ensue. Success will be

measured through biological surveys.

IV. RESOURCE IMPACTS:

1. The populations of the target species (yellow perch, pumpkinseed sunfish, largemouth and smallmouth bass, and bluegill), which are exotic species in Washington, will be severely and negatively impacted. The population of sculpins will also be negatively impacted; however, this species has recovered after every rehabilitation of these waters in the past. Complete kills of any of the target species are unlikely.

2. Regional and District Habitat, Wildlife and Non-Game managers have been apprised of our rehabilitation plans. No unmitigated concerns have been expressed on the potential impacts to non-targeted species.

According to Bradbury (1986), the effects of rotenone on benthos are variable, depending on the concentrations and species. Crustaceans are most tolerant while the smaller insects are most affected. Immediate reduction of populations averages 25%, and survival doubles when access to bottom sediments exists. Benthic communities generally recover to at least pretreatment levels within two months. Zooplankton is more severely impacted, and communities generally take two to twelve months to fully recover. While relatively tolerant of even heavy doses of rotenone, amphibians (especially larval) are at risk, and herptiles are affected somewhat less so. Almost no chance of eliminating an entire population exists.

3. Water withdrawal from the lake for irrigation will be halted until the rotenone has degraded below levels detectable by bioassay (trout survive in the water for 48 hrs). Most irrigation will have ceased for the season by the time treatment occurs. A portion of the waters treated is a source of drinking water for livestock. The product label does not restrict livestock watering at allowable concentrations of use, and the levels of rotenone used in this treatment (1 ppm or less) are lower than the maximum allowable (4 ppm). All known water rights holders will be advised of these restrictions.

These waters are not a source of potable water for humans. The Grant Co. Health District reviewed water sample test results for water systems on Blue and Park Lakes for the period October through November 1996 just after the previous rehabilitation. They did not find any unsatisfactory water samples in their review.

The lakes will be closed to angling and retention of fish during the treatment and until the season reopens the following spring. The fishery for perch and bass will be eliminated. The following year's opening day fishery will occur as planned with an early plant of catchable sized rainbow. Other recreational uses such as hunting, boating, and swimming will be curtailed during the planned period of treatment (2-3 weeks, probably late Oct). Most of these activities would be limited by cold temperatures by the time treatment occurs.

Probably the largest resource impact to near-lake residents will be the dead fish accumulating along the shoreline. Besides aesthetic concerns, some odor may occur depending on the weather

following the rehabilitation. Exactly where and how many dead fish accumulate will also depend on the weather, particularly wind speed and direction.

4. Professional biologists and other naturalists have visited this site frequently over the past 50 years. To our knowledge, no endemic, rare, threatened or otherwise listed species will be significantly impacted by the rehabilitation.

V. MITIGATING FOR ADVERSE IMPACTS:

1. A season extension from early September until the time of treatment and dropping the daily limit will be sought to allow harvest of as many of the remaining desirable fishes as possible by the public. Provided catchable-sized fish are available the following spring, no loss of recreational trout fishing will occur. Trout fry survival and growth will be greatly enhanced, and future trout fisheries will attain their previous status. This outcome more than mitigates the loss of current angling, and hunting or other human recreation during the planned time of rehabilitation. No removal of dead fish is planned as the nutrient base contained therein is best returned to the lake, nor do resources permit such a removal. Timing the rehabilitation late in the fall will reduce the impact to all resources substantially.

2. Portions of Blue Lake, Alkali Lake, and the connecting stream are sources of drinking water for livestock. The concentration of rotenone used in the treatment of Blue Lake will be far below that considered harmful to mammals. The landowners will be notified of the rehabilitation and consequent exposure of livestock to rotenone.

3. Fall rehabilitation will not interfere with waterfowl spring nesting. The eradication of spiny-ray fishes would also benefit waterfowl through increased production of invertebrates. Stocked populations of trout will not be anywhere near as numerous as the current spiny-ray population. No endemic, rare, threatened or otherwise listed species are known to inhabit this area during the time proposed for this treatment.

4. Protective wear for the eyes, face and hands will be supplied on-site for all purveyors of rotenone. Superior techniques and equipment not available during previous rehabilitation attempts will be employed during this rehabilitation, further increasing the chances for success.

5. All landowners will be notified of the treatment, and access to the lakes will be posted during treatment according to Department of Ecology NPDES guidelines. Water withdrawals, swimming, possessing or consuming dead fish will cease during the period of toxicity.

VI. RECREATIONAL IMPACT: also see I.A., II and III

Recreational opportunity will be increased. Fewer than 14,000 angler trips are estimated to occur at Blue and Park Lakes this year due to the decline in the fishery; and at least a third of that total occurred on opening weekend of fishing. The level of participation will quickly decline further, probably to around 7-8,000 annually if no action is taken immediately (no opener, fewer

trout overall, but six months good warmwater fishing, ~ 40 trips/day). Given the success of the planned management action, 5-6,000 angler trips are estimated for opening day alone. Another 30,000 angler trips are conservatively estimated for the remainder of the season.

Angler success should reach three to five fish per trip. Yearling trout should average about 12 inches. Carryovers should be expected to be about 5% of the catch and average 14-16 inches for 2-year-olds and 16-18 inches for 3-year-olds.

VII. ECONOMIC IMPACTS:

Conservatively, at least 35,000 trips annually will be made to Blue and Park lakes as a result of the proposed management action. These trips would have an economic impact totaling at least \$1,326,500 per year (1991 dollars; based WDW estimate of \$37.90 per trip). With roughly 50% of the participants in the opening day fishery coming from the Westside, much of this economic boon would be outside dollars infused into the local economy. The fishery as it now exists generates far less as participation decreases with the declining trout catch. Rehabilitation would bring back the fishery and associated economic activity.

Allowing these waters to revert to primarily spiny ray fishing might produce about 10,000 trips annually with an associated value of \$379,000. This assumes the warmwater fish populations' stay in balance and angling success is at least fair. Without an opening day event, fewer of these dollars would come from outside the region. The cost to manage a warmwater fishery in terms of monitoring, setting appropriate regulations, surveying the creel, etc is difficult to determine, but generally more time consuming than for trout-only management.

The total annual costs to Columbia Basin Hatchery to plant Park and Blue lakes with 320,000 fingerlings is \$13,440 (based on 1989 in-house cost analysis \$0.042/fingerling). The cost of annual planting with enough catchables necessary to attract the same participation with the current environment is \$146,272 (70% survival on 320,000 fingerlings = 224,000 at \$0.653/fish). The rehabilitation will cost the Department about \$175,000 (including costs of rotenone, time, travel).

If rehabilitations occur every 10 years, the cost the rehab, a one time catchable plant (after rehabilitation), and fingerling plants (9 yrs.), and totals about \$442,000. During this same 10 years, the fishery could be worth over \$13 million, approximately a 30-fold profit to the state's economy.

The cost to manage with annual catchable plants over the same 10-year period is approximately \$1,462,720; more than three times the amount to manage with rehabilitation and fingerlings. However, hatchery space and water are fully utilized in accomplishing the current program. If greater numbers of larger, catchable fish were to be raised, many other waters statewide would suffer cutbacks in current planting allotments. Hatchery sites are at a premium, and even if sites were available, the additional Department investment in hatcheries, time and equipment dollars to manage our fisheries in this manner would be considerable in the long term.

VIII. RELATED MANAGEMENT ACTION:

Blue and Park Lakes will be planted with 150,000 catchable rainbow trout @ 2-4/lb. for the 2007 opener. The spring of 2007 and thereafter, 320,000 rainbow trout fry @ <100/lb. will be planted to produce a fishery the following year. Creel surveys will continue on opening days.

IX. PUBLIC CONTACT:

Public meetings were held in Ephrata and Olympia to explain Region Two 2005-06 rehabilitation proposals, assess public opinion, and address local concerns. The announcement was provided statewide and to area papers and radio stations and mailed to landowners and residents near the lakes.

The public meeting in Ephrata was held at 6 pm on July 13, 2006 at the Ephrata High School. Twenty-seven members of the public attended including at least one newspaper reporter. Local residents, primarily from Blue Lake, made up the majority of those present. After DFW's presentation explaining rehabilitations in general and the current proposals, eleven people provided comment. Ten of those providing comment were against the rehabilitation of Park and Blue Lakes, and one spoke in favor of the proposals.

Most of those who spoke in opposition to the rehabilitation favored a mixed species fishery including a smaller number of large trout (7 comments). Most also suggested other management options (7 comments including changed limits and seasons, stocking bigger fish, charge additional fees to pay for bigger fish, stock later in season, stock at night, get rid of cormorants, conduct tournaments) and/or did not believe DFW's data (6 comments including CPUE, stocking, fingerling survival, economic impact, viability of rehabilitations in general). Apprehension concerning the use of rotenone and associated compounds was also often cited, including well contamination, nutrient loading from dead fish, violation of Clean Water Act, and impacts to the lakes' ecology in general (7 comments). Also contentious were the large number of shoreline campers, effluent, garbage, and other types of water-related recreation (3 comments). Some wanted to wait at least another year to see what developed (2 comments). One person recommended a higher dosage of rotenone if the rehabilitation proceeds.

While at least three resorts were represented in the crowd, only one chose to speak publicly and was in favor of the treatments. Comments included the economic benefit county-wide, family recreation provided over many generations, algae blooms occur whether lakes had been rehabbed or not, and no impact ever found to any resorts' wells after rehabilitation.

The public meeting in Olympia was held at 7 pm on July 19, 2006 at the Dept of Natural Resources Building. No one from the public attended.

In addition to comments at the public meetings, over 50 letters (14), e-mails (29), and calls (10) were received from residents statewide concerning the rehabilitation of Blue and Park Lakes. Of this these contacts, 49 were in favor of the treatment and four were against the treatment. Most of the correspondences in favor cited good trout fishing as their reason to support the

rehabilitation, and many of these made it a point to say that their extended families were also in favor. Some were signed by up to a half dozen adults.

With approximately 50% of the lake's users living outside Grant County, actual percentages pro and con are difficult to obtain. Public support may be best judged by the number of participants in the fishery (vis-à-vis Recreational Impacts).

Comments on the SEPA for rehabilitations statewide will also be accepted during the month of August. The SEPA can be found on WDFW or WA Dept of Ecology's web sites, or at County offices (usually Planning Commission). Additional comments may be sent directly to WDFW via mail or e-mail.

Initiated by: Region Two Fisheries Management

LAKE MANAGEMENT PLANS

Updated July, 2006 - J.W. Korth and J. Tabor

Water(s): North Potholes (Westlake ponds)

Description: Potholes Wildlife Management Area, Sections 33 and 36, T19N, R27E and Section 31, T19N, R28E. Approximately 2 miles west of Moses Lake, Grant County, WA

Size:	Maximum Depth:	Volume:
124 surface acres	6 feet	626 acre-feet

OUTLET: None. Natural and man-made dikes separate waters (40 separate ponds) in the proposed treatment area (TA) from the main body of Potholes Reservoir.

INLET: none **Water Source:** Potholes Reservoir and subsurface seepage from Moses Lake and irrigated land.

Management History: The water proposed for treatment is a peripheral part of Potholes Reservoir and is within the Potholes Wildlife Area. Surface water in the treatment area is isolated from the remainder of Potholes Reservoir by a series of small dikes that were constructed in the late 1970's. The purpose of the dike system was to allow management of warm-water (spiny-ray) fish species to provide an enhanced fishery. Management consisted primarily of removing carp and other undesirable fish species and re-stocking with desirable species (largemouth bass and bluegill).

In addition to the use by waterfowl, the TA is used heavily by a wide variety of wetland-associated wildlife species including the state endangered Northern Leopard Frog (NLF). The TA and a small part of Potholes Reservoir immediately adjacent to it contains the entire known population of the NLF in Washington.

Another of the more significant wildlife uses of the TA is by breeding ducks. Breeding duck use increased dramatically after rotenone treatment to remove carp in 1980. Numbers of duck broods peaked at very high levels (100+) in the early 1980's, but declined annually to pre-treatment (very low) numbers by summer of 2003. Carp were observed in waters of the TA by the late-1980s.

The focus of wildlife management in the TA has been to insure habitat quality for leopard frogs and populations of a diverse assemblage of wetland-obligate wildlife species including breeding waterfowl and promote wildlife observation that does not result in negative impact to wildlife use.

Some of the more significant planned wildlife-related management actions in the TA in the future include: 1) Enhancing habitat quality for the NLF and desirable wetland-obligate wildlife species. 2) Minimizing human disturbance during the nesting and brood-rearing period for ducks. 3) Maximizing in-water food resources (i.e., invertebrates and submerged aquatic plants) for ducks (e.g., carp removal). 4) Promotion of wildlife viewing in a manner that minimizes

human disturbance of wildlife (i.e., design and implement a watchable wildlife 'trail' and other facilities to support it in the area). 5) Implement management actions (e.g., bullfrog control and diking to isolate individual ponds) to benefit the state-listed Northern Leopard Frog.

T&E Flora and Fauna: Professionals from many resource fields have visited this site countless times during the last 40 years. Use of the area by several wildlife species of concern has been documented. These species include:

- | | |
|--------------------------|--------------------------------|
| 1) Northern Leopard Frog | (State endangered) |
| 2) Bald Eagle | (State and Federal threatened) |
| 3) Western Grebe | (State candidate) |
| 4) Sagebrush Lizard | (State candidate) |

The TA and a small part of Potholes Reservoir immediately adjacent to it is the only location known to support the NLF in Washington. Research to identify limiting factors and habitat relationships for the purpose of protecting and enhancing the population is in progress and been conducted in the TA since 2002. Bald Eagle use of the TA is primarily during winter and early spring for feeding. Waterfowl is the primary component of the eagle's diet in the TA.

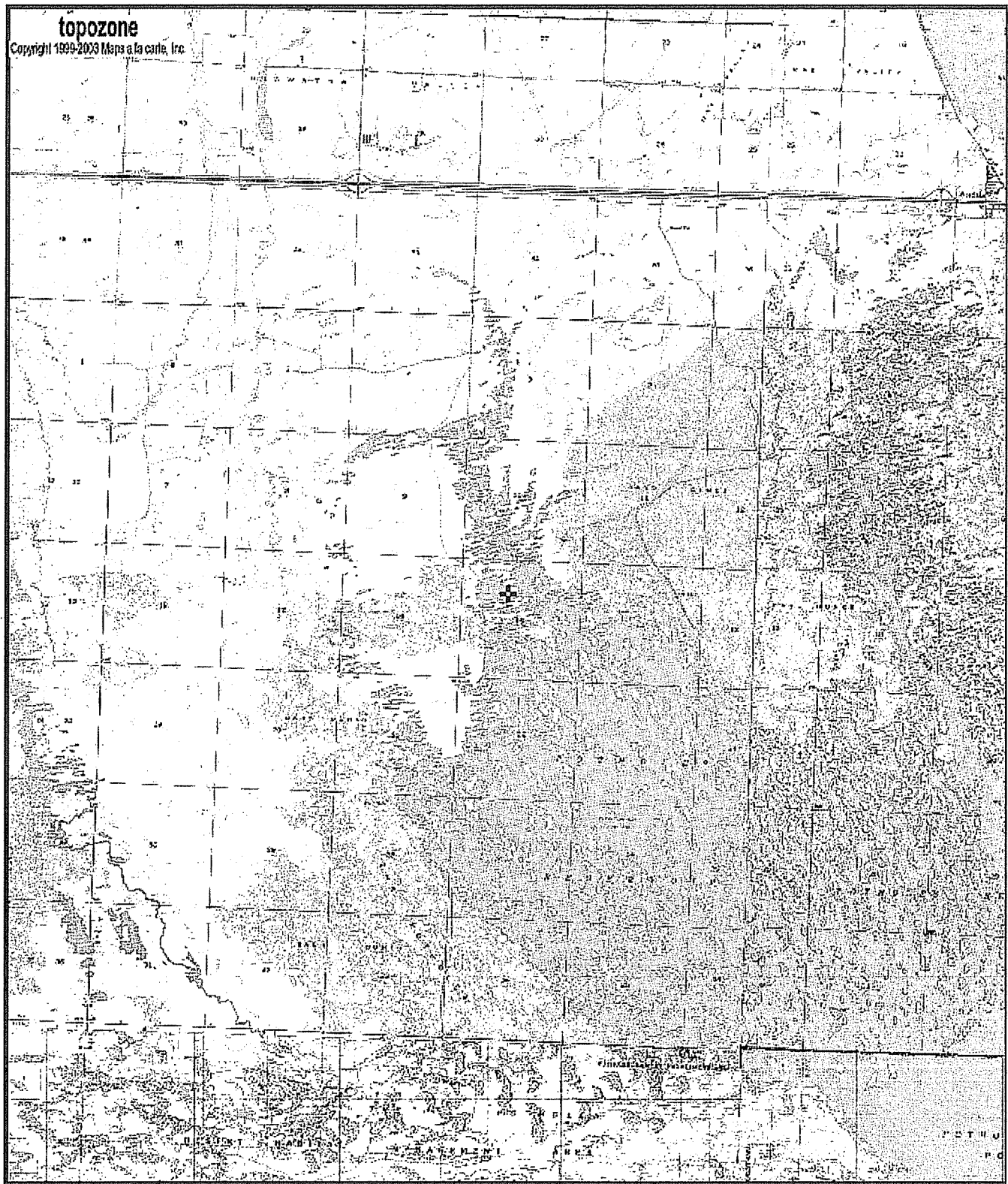
Current Management Objectives: Primary management of the Westlake area described above will be for leopard frogs and waterfowl. As the success of these management objectives are evaluated, secondary management for a low-key fishery may be implemented.

Current Wildlife Management Objectives and Strategy:

Current wildlife-related management actions in the TA include: 1) NLF research and management. 2) Minimizing human disturbance during the nesting period for ducks and geese. 3) Maximizing in-water food resources (i.e., invertebrates and submerged aquatic plants) for ducks and geese (e.g., coordinating with Fish Management program for carp removal). 4) Promoting wildlife viewing in a manner that minimizes human disturbance of wildlife. 5) Implementing management actions to benefit desirable species of wildlife and control/limit undesirable species.

Current Fishery Management Objectives and Strategy:

- Manage for largemouth bass, crappie and bluegill.
- Season: February 1 – mid October (last day before hunting season opener)
- Provide low key, walk-in fishery (maybe 200 angler trips per year)
- Survey periodically (electrofishing, netting, spot check angler use).
- Assess periodically for presence of undesirable species.
- Continue rehabilitation with rotenone when populations of unwanted fish species become over-abundant.
- Re-stock as necessary with desired species salvaged from other area lakes.



Map center is 47° 03' 15"N, 119° 25' 13"W (WGS84/NAD83)

Mae quadrangle

Projection is UTM Zone 11 NAD83 Datum

M=17.355
G=-1.773

PRE-REHABILITATION PLAN North Potholes (Westlake ponds)

I. PROPOSAL

A. Justification for Proposed Rehabilitation

Ponds within the proposed treatment area (TA) were treated with rotenone in Sept. 1980 to remove undesirable fish species including carp and provide the opportunity for a managed fish population of warm-water (spiny-ray) species to provide a sport fishery. Breeding duck use increased dramatically post-treatment. Numbers of duck broods peaked at very high levels in the mid-1980s and declined annually to pre-treatment (very low) numbers by summer of 2003. Carp were observed in most ponds in the TA by the late-1980s. The dominance of carp is the likely cause of the dramatic decline in observed duck use.

The TA and a small part of Potholes Reservoir immediately adjacent to it contains the entire known population of the state-endangered Northern Leopard Frog (NLF) in Washington. Since 1980, and the last rotenone treatment, a breeding population of bullfrogs has become established in the TA. Treatment with rotenone would reduce reproduction of bullfrogs, a serious threat to the NLF.

B. Physical Description of Water Proposed for Rehabilitation

1. WATER: Ponds in the northern-most part of Potholes Reservoir.
2. LOCATION: Sections 33 and 36, T19N, R27E and Section 31, T19N, R28E. Grant Co.
3. SURFACE ACRES: 124 MAXIMUM DEPTH: 6 feet
4. VOLUME: 1,701,558,144 lbs H₂O (626 acre-feet)
5. OUTLET: None (A series of small dikes separate waters in the TA from the main body of Potholes Reservoir.
6. STREAM: None FLOW: N/A
7. PUBLIC ACCESS: Entire Area.
8. LAND OWNERSHIP: PUBLIC 100% PRIVATE 0 %
9. ESTABLISHED RESORTS: None

C. Proposed Management Actions

1. WATER: 40 ponds in the northern-most part of Potholes Reservoir.
2. TARGET SPECIES: carp and bullfrog larvae
3. DATE LAST REHABED: Sept. 1980
4. PROPOSED TREATMENT DATE: September – October, 2006
5. REPLANTING DATE: to be determined
6. SPECIES: possible restock with bass and bluegill
7. CATCHABLES: n/a ; FINGERLINGS: n/a
8. PROPOSED TOXICANT: Rotenone, liquid CONCENTRATION: 4 ppm

AMOUNT (ROTENONE AT 5% ACT. INGRED): 835 gal.
9. METHOD OF APPLICATION: helicopter and ground spray
10. CREW DESCRIPTION: Leader(s) Jim Tabor Personnel ~ 6

II. PURPOSE:

Rehabilitation of the TA serves the purposes of fisheries, waterfowl, and endangered species management. Removal of carp will increase invertebrate production and enhance food availability for desired fish species, ducks, and other species of aquatic wildlife. Removal of bullfrog larvae will reduce competition and predation by bullfrogs on Northern Leopard Frogs and other native vertebrates.

III. INTENDED OUTCOME/MEASURE OF SUCCESS:

Waterfowl surveys will be conducted in July (duck brood count), August (molting ducks), and Oct.-Jan. (monthly aerial surveys for migrant/wintering waterfowl). Surveys for determining the presence of leopard frogs and bullfrogs will be made during spring and summer. Random creel surveys and biological sampling, as well as public comment, will be the measure of success for fisheries, if established. The complete elimination of carp from a system of this type is a challenge and certainly no certainty. Without a complete kill, 5 - 6 years of benefit would still be realized before rehabilitation is again necessary.

IV. RESOURCE IMPACTS:

1. The intent is that populations of the target species, carp and bullfrogs, will be severely and negatively impacted.
2. District and Regional Fisheries, Habitat, and Wildlife biologists support the proposed rehabilitation plan. The rehabilitation will benefit leopard frogs since it will decrease competition and predation on this species, especially from exotic bullfrogs. The rehabilitation would be done in fall, when larval leopard frogs have already metamorphosed, but bullfrog tadpoles would be susceptible

According to Bradbury (1986), the effects of rotenone on benthos are variable, depending on the concentrations and species. Crustaceans are most tolerant while the smaller insects are most affected. Immediate reduction of populations averages 25%, and survival doubles when access to bottom sediments exists. Benthic communities generally recover to at least pretreatment levels within two months. Zooplankton is more severely impacted, and communities generally take two to twelve months to fully recover. While relatively tolerant of even heavy doses of rotenone, amphibians (especially larvae) are at risk, and turtles are affected somewhat less so.

3. The fishery has already been almost completely lost, but could be reestablished again soon after treatment. Creating a successful fishery risks increased human use of the area and the associated impacts to habitat and wildlife. Seasons and access might be structured to minimize disturbance to leopard frogs and waterfowl nesting/rearing. These waters are not a source of potable water for humans or livestock. The area will be closed to angling, and other recreational uses such as wildlife viewing during the planned period of treatment.

4. Professional biologists and other naturalists have visited this site frequently over the past 40 years. The WDFW Habitat and Wildlife Programs and PHS maps have been consulted. The TA is used heavily by several species of wildlife in addition to the endangered NLF and breeding ducks. The proposed treatment would increase use by desirable wildlife species. No wildlife uses will be impacted in a negative way by the proposed rotenone treatment.

V. MITIGATING FOR ADVERSE IMPACTS:

1. Human disturbance resulting from the fishery might be managed by limiting access to off-site parking areas to preserve the walk-in fishery. Rehabilitation will be completed before the nesting season begins. The diverse habitat in the TA is home to much and varied wildlife, all of which would benefit from the increased aquatic food production after carp removal. Leopard frogs will benefit from the reduction of bullfrogs as a result of removing bullfrog larvae. No removal of dead fish is planned as the nutrient base contained therein is best returned to the lake.

2. No "downstream" resources will be impacted. Water within the TA is isolated from other water in the Potholes Reservoir by a series of small dikes.

3. No endemic, rare, threatened or otherwise listed species known to inhabit this area will be adversely affected by the proposed treatment.

4. Protective wear for the eyes, face and hands will be required for all purveyors of rotenone.

5. Ponds will be posted according to Department of Ecology guidelines to notify the public of the treatment and discourage the public from possessing or consuming dead fish.

VI. RECREATIONAL IMPACT: ALSO SEE PROPOSAL I.A.

Almost no fishery currently exists, so angling opportunity could be greatly enhanced. Hard data are not available to accurately judge CPUE on these waters because a shortage of manpower prohibits surveying all the area year around lakes and ponds on a regular basis. Angling pressure in the TA is has been "low key" and consistent in the past, rather

than intense and concentrated temporarily as on opening day waters. Recreational opportunity will be increased.

The increased number of ducks produced in the waters to be treated will be available to hunters.

VII. ECONOMIC IMPACTS:

Given the discussion in part VI, and due the as yet undetermined nature of the fishery, the expected economic value is also difficult to estimate. However, as recreational opportunity increases, so goes the flow of dollars. Even a minimal fishery could be expected to generate several hundred additional angling trips, resulting in an increased economic impact totaling \$7-8,000 per year to the state's economy (1991 dollars; based WDW estimate of \$37.90 per trip). Rehabilitation would bring back the fishery and associated economic activity.

The number of waterfowl hunting trips would be expected to increase, but an estimate of the magnitude of the increase would be difficult to predict.

Placing a value on protecting the state's few remaining populations of leopard frogs is complicated. Certainly there would be some concrete value to wildlife viewers, but the number of such trips generated is not known. Protecting the state from the financial consequences of federal law should leopard frogs become federally listed would be highly valued. It is considered better at this juncture to protect the remains of the population than assume it valueless and do nothing.

VIII. RELATED MANAGEMENT ACTION:

Assessment surveys for leopard frogs, waterfowl production, and other wildlife would follow treatment. If a fishery is deemed desirable and a good fit with frog and waterfowl objectives, broodstock to re-populate these waters would likely be captured from other systems.

IX. PUBLIC CONTACT:

A public hearing was held in Ephrata and in Olympia to explain Region Two 2005-06 rehabilitation proposals, assess public opinion, and address local concerns. The announcement was provided statewide and to area papers and radio stations and hand delivered or mailed to landowners and residents near the lakes.

The public meeting in Ephrata was held at 6 pm on July 13, 2006 at the Ephrata High School. Twenty-seven members of the public attended including at least one newspaper reporter. Local residents, primarily from Blue Lake, made up the majority of those

present. After DFW's presentation explaining rehabilitations in general and the current proposals, eleven people provided comment. No comment concerning the proposal to rehabilitate the Westlake Area was provided. The public meeting in Olympia was held at 7 pm on July 19, 2006 at the Dept of Natural Resources Building. No one from the public attended. No other comment has been received to date via letters, e-mails, or calls.

Comments on the SEPA for rehabilitations statewide will also be accepted during the month of August. The SEPA can be found on WDFW or WA Dept of Ecology's web sites, or at County offices (usually Planning Commission). Additional comments may be sent directly to WDFW via mail or e-mail.

Initiated by: Region Two Wildlife and Fisheries Management

WATER MANAGEMENT PLAN

A. Water: McDowell Lk Mucode 4K8TZD Wacode: Update
Management Area: NE Washington 2006
— 48° 28' 04"N, 117° 40' 53"W

B. STEWARDSHIP

Gamefish___ Food Fish___ Unclassified Fish___ Other___
1. Management Objective

Escapement Objective:
2. Management/Regulation Strategy:

AND/OR

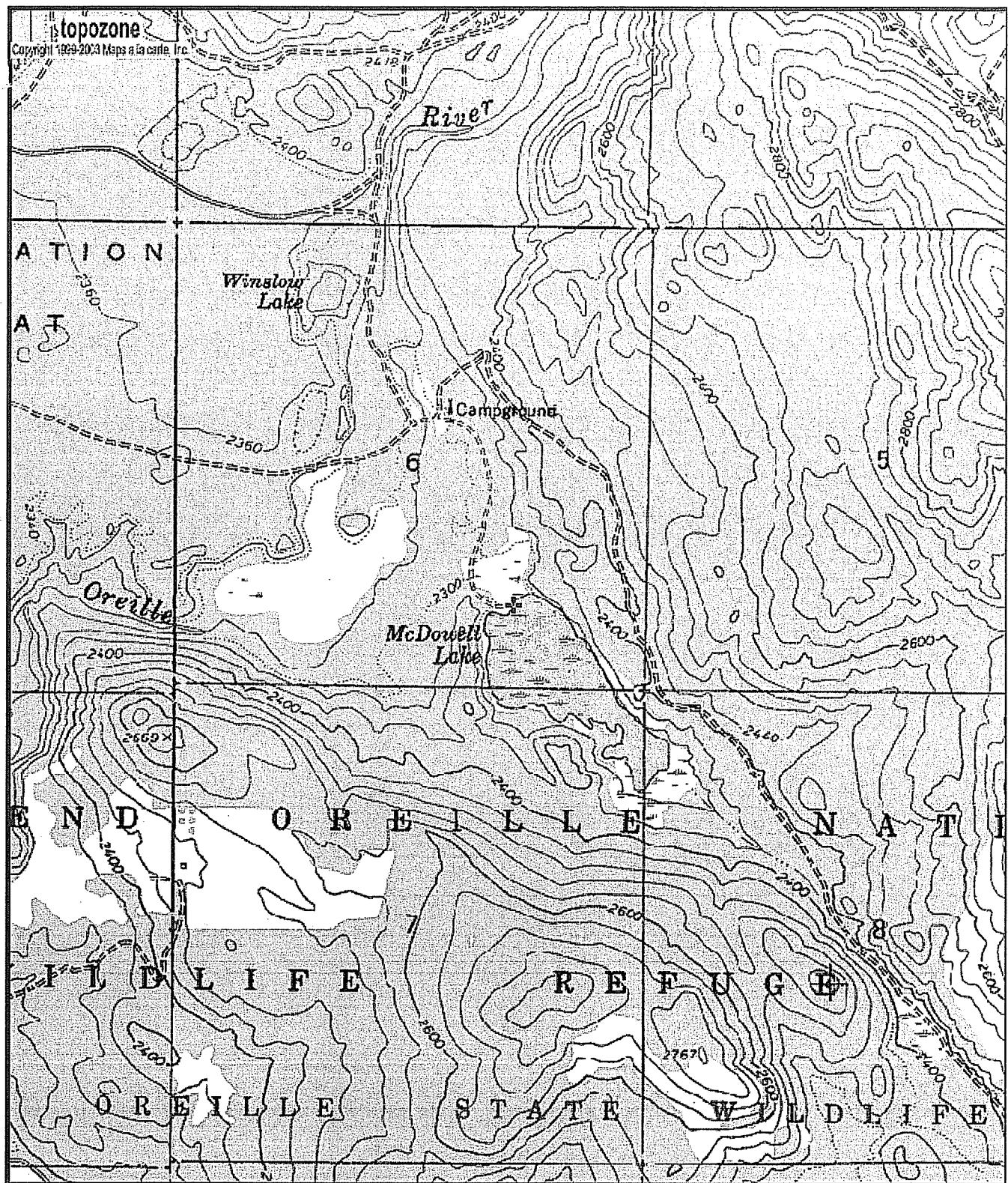
C. UTILIZATION

1. Target Species: Mixed___ Trout Only X Warmwater
Carp/Crawfish___ Other___
2. Fishery Objective: Production Trophy X Other___
3. Catch Objective: OD/Sea
Spp. Redband RB Catag ___ #Fish/Hour 2 #Fish/angler 8 Ave
Size 14"
Spp. ___ Catag ___ #Fish/Hour ___ #Fish/Angler ___ Ave Size
Spp. ___ Catag ___ #Fish/Hour ___ #Fish/Angler ___ Ave Size
4. Angler Use Objective(#Anglers/Acre): Opening Day ___ Season
0.25
Comments:

5. Production Strategy:
Spp. Redband RB #Fish/Acre 10 #Fish/Pound 20 Plant Month
May
Spp. ___ #Fish/Acre ___ #Fish/Pound ___ Plant Month
Spp. ___ #Fish/Acre ___ #Fish/Pound ___ Plant Month
6. Regulation Strategy: Hook & release flyfishing

7. Comments: Low stocking rate is to achieve quality size.
Stocking occurs every other year

Form Revised 11/2/95



0 0.3 0.6 0.9 1.2 1.5 km
0 0.2 0.4 0.6 0.8 1 mi

Map center is 48° 28' 12"N, 117° 40' 58"W (WGS84/NAD83)

Cliff Ridge quadrangle

Projection is UTM Zone 11 NAD83 Datum

M=17.349
G=-0.511

PRE-REHABILITATION PLAN
McDOWELL LAKE, STEVENS COUNTY
48° 28' 04"N, 117° 40' 53"W

I. PROPOSAL: Treat McDowell Lake to remove tench

A. Justification for proposed rehabilitation

1. McDowell Lake has had a population of tench (*Tinca tinca*) since its creation in 1972. Over the years at least three attempts have been made to eradicate them without success. Timing, rotenone concentrations and spring source refugia could have been causes.
2. McDowell Lake is managed as a hook- and- release flyfishing water. It is expected to produce a quality fishing experience for native redband rainbow trout. The unlimited expansion of the tench population after each previous rotenone treatment has negatively impacted management efforts to achieve management goals. The reduction of water quality caused by this species and the competition for food resources has not only affected the trout but also waterfowl use. The lake is located on the Little Pend Oreille National Wildlife Refuge and as such refuge managers have an expectation that waterfowl and other wildlife species should thrive in its presence. Most are not.
3. McDowell Lake is located near the City of Colville, Washington and approximately 70 miles north of Spokane, Washington. This location makes it a popular flyfishing destination. The limited access (walk-in) and pristine environment are popular features. Volunteer angler check stations have been monitored at the lake since 1997, to assess the fishery. In 1997, the volunteer angler station was not installed until late June, and it likely took anglers awhile to begin using it, so angler numbers don't necessarily reflect actual use. Also, not all anglers chose to use the stations so the following table shows only general trend data.

YEAR	# ANGLERS	HOURS FISHED	TROUT/ANGLER
1997	6	34.5	8.5
1998	20	90.5	6.7
1999	38	137	5.3
2000	No data		
2001	4	18.5	9.5
2002	42	164	4.3
2003	43	182.5	6.3
2004	23	91.5	7.3
2005	1	3.0	3.0

B. Physical Description

1. Name of water: McDOWELL LAKE
2. Location: Section 6, 7, 8 - T34N, R41E 11 ½ miles SE of Colville, Washington
3. Surface area: 47 acres. 26.08 acres after drawdown.
4. Maximum depth: 30 ft
5. Volume of water: 519 ac-ft. Actual treated volume will be 139 ac-ft after drawdown.
6. Outlet statistics: One outlet controlled by vertical pipe and dam boards. Will be blocked during treatment. Intermittent inlet; flow is expected to be non-existent during autumn.
7. Stream miles: None when the lake level is lowered.
8. Number of developed access areas: None
9. Land ownership: US Fish and Wildlife Service
10. Resorts: None

C. Proposed Management Action

1. Date of last rehabilitation: 1988
2. Toxicant used: Rotenone
3. Proposed treatment date: 10/06 or 10/07
4. Estimated replanting date: Following spring
5. Species to restock: Native redband rainbow trout
6. Number of fry, legals to stock: 1,000 at 5 fish/pound
7. Proposed toxicant name, concentration, and amount: 185 gal. Liquid rotenone, 4ppm,
8. Method of application: aerial application of liquid rotenone
9. Size of crew and number of crew members: One pilot and crew member + four ground personnel.
10. Name of licensed applicator: Curt Vail, WDFW District 1 Fish Biologist

II. PURPOSE: Remove tench to improve trout fishery and other wildlife habitat.

III. INTENDED OUTCOME/MEASURE OF SUCCESS: Elimination of tench/no tench presence after three years or longer.

IV. RESOURCE IMPACTS

1. Target species: Removal of tench resulting in restoration of the trout fishery.
2. Detail impacts to other wildlife: At the time of treatment waterfowl will have migrated. Terrestrial animals will have moved to other habitats as a result of the lake drawdown. There is minor fall waterfowl migrant use of the lake but other nearby waters are available. Minimal impact is expected. There could be an increase of shorebird use enhanced by the drawdown, which will expose extensive mud flats and bottom areas. Seasonality of treatment will preclude adverse impacts to fledged eagles, to insects and other invertebrates, and other species of concern.

3. Detail potential impacts to human related uses of water or shoreline: The only human use of the lake and shoreline is fishing and wildlife viewing. As of 2005, nearly no fishing occurred at the lake so human related uses will not be impacted. Wildlife viewing and environmental education activities will be affected but only for one to two months before winter arrives.
4. Describe impacts to downstream resources: Downstream resources will be isolated following drawdown prior to treatment. When the lake level has been drawn down to its lowest extent, dam boards on the outlet structure will be put in place preventing treated water from leaving the lake.
5. List any endemic species, and or species which are threatened, endangered or otherwise listed: There are no rare or listed species present except for bald eagles that forage at the lake. The nearest nest is on the Refuge at Bayley Lake, approximately 5 km to the SSE. The timing of the treatment will not impact that nest. The post-treatment availability of fish will actually be an asset to the eagles.

V. MITIGATING FOR IMPACTS

1. Describe how impacts can be mitigated, or softened: A fall treatment will affect the least number of species as migrations will have occurred and herptiles will be dormant. Adult forms of aquatic species, excluding fish, are not affected by rotenone. Insect and zooplankton species diversity is not expected to be adversely impacted; species abundance is expected to return to pre-treatment levels within a year.
2. Describe measures to protect downstream resources: None (see #4 above).
3. Describe measures to protect endemic species, and/or species that are rare, endangered or threatened: Treatment to occur in the autumn, which will allow locally-nesting avian species to disperse from breeding grounds. Identification of vegetation species of concern will result in operations being conducted in a manner to avoid trampling damages.
4. Describe the safety precautions for pesticide applicators that will prevent health hazards: Protective apparel including Tyvek outerwear, gloves and liquid rotenone approved respirators will be provided as per the EPA label for Prenfish toxicant.

For aerial treatment with the liquid rotenone formulation (Prenfish), the American Fisheries Society's "Rotenone Use in Fisheries Management: Administrative and Technical Guidelines Manual" recommends that large droplets or streams of dilute rotenone are preferred over mist or small droplet applications. Mist or small droplet applications may result in drift that reduces treatment efficacy and increases the risk of detrimental effects on nontarget organisms and the human environment. The 'accepted best practices' of the AFS Manual will be followed.

5. Describe how the area will be closed to the public during the application: Lake access is gated at the lower end of the lake. Foot traffic will be alerted with visual postings. The upper end of the lake will be posted restricting access. NPDES Permit No. WA0041009 requires notification prior to the treatment project of all property owners located within one-quarter mile of the shoreline and 500 feet upland of the treated body of water. WDFW shall publish announcements in the legal section of the local newspaper 10-21 days prior to treatment notifying the public of the treatment project.

VI. RECREATION IMPACT

There will be no recreational impact caused by the actual treatment. The fishery is non-existent at this time due to the presence of tench. The trout fishery will be returned in the year following treatment with stocking of native rainbow trout. This will be an improvement over existing conditions.

VII. ECONOMIC IMPACT

McDowell Lake is managed as a quality hook- and- release fly fishing water. Economic impact will be minor since the lake is not a production type water that receives heavy fishing pressure.

VIII. PLANTING

The lake will be restocked in the spring following treatment with 1,000 native rainbow trout.

IX. PUBLIC MEETING

A public meeting will be held in the summer of 2006 (or 2007), depending on Refuge Managers' timing of Eurasian water milfoil treatment. The treatment project will be subject to public review during the annual SEPA (State Environmental Policy Act) process for the expected autumn 2006 treatment. Note: The public meeting was held at 7:00 p.m. July 6, 2006 at the Stevens County Conservation District office in Colville. One person attended in support of the treatment.

**PRELIMINARY LIST OF 2007-2008
PROPOSED WATERS FOR TREATMENT**

Attachment 1: Waters Proposed by WDFW for Treatment With Rotenone

2007		Name Location		Grid Location		Size		Rotenone required @ 5%		Treatment History		Proposed Treatment	
County	Water	Section	Township Range	Acres	Acre Ft.	Powder (lbs.)	Liquid (gal.)	Years Previously Treated	Target Species	Treatment Dates	Outflow at Treatment		
Okanoan	Chopaka Lake	33	40N 25E	149	6,605	17,960	30	Never Treated	SMB	Fall 2007	Chopaka Creek; can be blocked		
		4	39N 25E										
	Bowers Lake	28, 33	40N 25E	12	120	326	5	Never Treated	Need Survey	Fall 2007	None		
	Starzman Lakes	26,35,36	32N 24E	14	196	533	5	50,72,81	PS,LMB	Fall 2007	None		
	Blue Lake (Lime Belt)	31	36N 26E	16	160	1,305	5	Never Treated	BBH	Fall 2007	None		
		6	35N 26E										
Adams & Lincoln	Sprague Lake	1,12	20N 37E	1,841	19,360	108,325	180	1985	P,BBH,SF,YP,WE	Fall 2007	Cow Creek to Hallin Lk eventually subterranean at Dixon's pond		
		5,6,7	20N 38E								Watershed Eventually Drain: To Sprague Lk		
	Inlet - Negro & Damage Creeks	21,28,29,31,32	21N 38E,39E	13 miles		2,520	90	1985	CP,BBH,SF,YP	Fall 2007	To Sprague Lk		
	Inlet - Damage Creek, includes Dixon's pond	14,23	21N 39E	4	57			1985	CP,BBH,SF,YP	Fall 2007	To Sprague Lk		
	outlet - Cow Creek	11,12,14,23,26,35	20N 37E	8 miles				1985	CP,BBH,SF,YP	Fall 2007	To Hallin Lk; dep. on flow, eventually subterranean at Dixon's pond		
	Hallin Lake	2,10,11,15	19N 37E	33	87	800	90	1985	CP,BBH,SF,YP	Fall 2007	Can be blocked/treated		
	Cow Lake	15,16	19N 37E	226	1,142	9,580	45	1985	CP,BBH,SF,YP	Fall 2007	Can be blocked		
		16,20,21											
	Grant	Corral Lake	15, 16	17N 28E	78	2,496	13,900	30	65,71,76,83,88,97	PS	Fall 2007	Blythe Lake	
		Blythe Lake	14, 15	17N 28E	32	613	3,200	30	65,71,76,83,88,97	PS, C	Fall 2007	Chukar Lake	
	Chukar Lake	14	17N 28E	13	200	1,050	20	65,71,76,83,88,97	PS, C	Fall 2007	Scaup Lake		
	Scaup Lake	14	17N 28E	9	67	350	10	65,71,76,83,88,97	PS, C	Fall 2007	None at time of treatment		
	Heart Lake	28	17N 29E	26	889	4,800	10	59,87,97	PS,YP	Fall 2007	Canal Lake		
	June Lake	21, 22	17N 29E	11	163	840	10	90,97	PS,YP	Fall 2007	NN Windmill Lake		
	North North Windmill Lake	22	17N 29E	4	46	250	10	90,97	PS,YP	Fall 2007	North Windmill Lake		
	North Windmill Lake	27	17N 29E	20	356	1,850	20	75,90,97	PS,YP	Fall 2007	Windmill Lake		
	Windmill Lake	27, 28	17N 29E	37	1,120	5,800	10	68,75,82,87,90,97	PS,YP	Fall 2007	Canal Lake		
	Canal Lake	2, 28, 33	17N 29E	92	2,043	10,600	20	59,68,75,82,87,90,97	PS,YP	Fall 2007	Pit Lake - can be blocked		
Yakima	Byron Pond	9,10,11,12	8N 23E	84	147	0	180	1986	Carp	Spring 2008	None at time of treatment		
29 May 2007: Preliminary Proposed Waters					2,701	35,867	183,989	800					